

## Conceptualising the Requirements of CRM from an Organisational Perspective: a Review of the Literature.

Olaf Boon, Brian Corbitt, Craig Parker  
School of Information Systems  
Deakin University  
221 Burwood Hwy  
Melbourne, Australia, 3125

Email: [oboone@deakin.edu.au](mailto:oboone@deakin.edu.au)

Tel: +61 3 9244 6273

Email: [bcorbitt@deakin.edu.au](mailto:bcorbitt@deakin.edu.au)

Tel: +61 3 9244 6266

Email: [cparker@deakin.edu.au](mailto:cparker@deakin.edu.au)

Tel: +61 3 9244 6924

### Abstract

For an organisation to undertake a Customer Relationship Management (CRM) implementation program it needs to consider a multitude of requirements. Some authors have hinted at viewing CRM within a wider perspective than just customer centric perspectives. The aim of this paper is to discuss the domain and conceptualise some of the requirements of CRM from an organisation's point of view. However, CRM needs to be identified as the whole organisation, including its internal and external environments. Undertaking CRM in any organisation needs to be preceded by a sequence of stages. An organization needs to develop a roadmap outlining the path to become CRM centric. Therefore an organisation should address, or at least consider, a list of those factors at every stage of a CRM implementation program, for an implementation program to be effective. The main focus of literature in CRM has been customer centric. This paper, being the first stage of much wider research, will focus on the organisation and the internal environment. This paper will identify three information systems (IS) and information technology (IT) requirements in organisations that are integral parts of CRM. These need to achieve a level of synergy for successful CRM. To understand these three requirements (front-end systems, back-end systems, and data-handling technologies) in a CRM project is too great in magnitude at this early stage of the research. This paper begins to draw together the tenuous links between the three requirements of information systems (IS) and information technology (IT) systems. Writing this paper and shifting its focus towards requirements engineering, the author has realised that a whole area of literature has to be explored, because CRM is another IS implementation.

### Keywords:

Client relationship management, requirements engineering, information systems

**Introduction.**

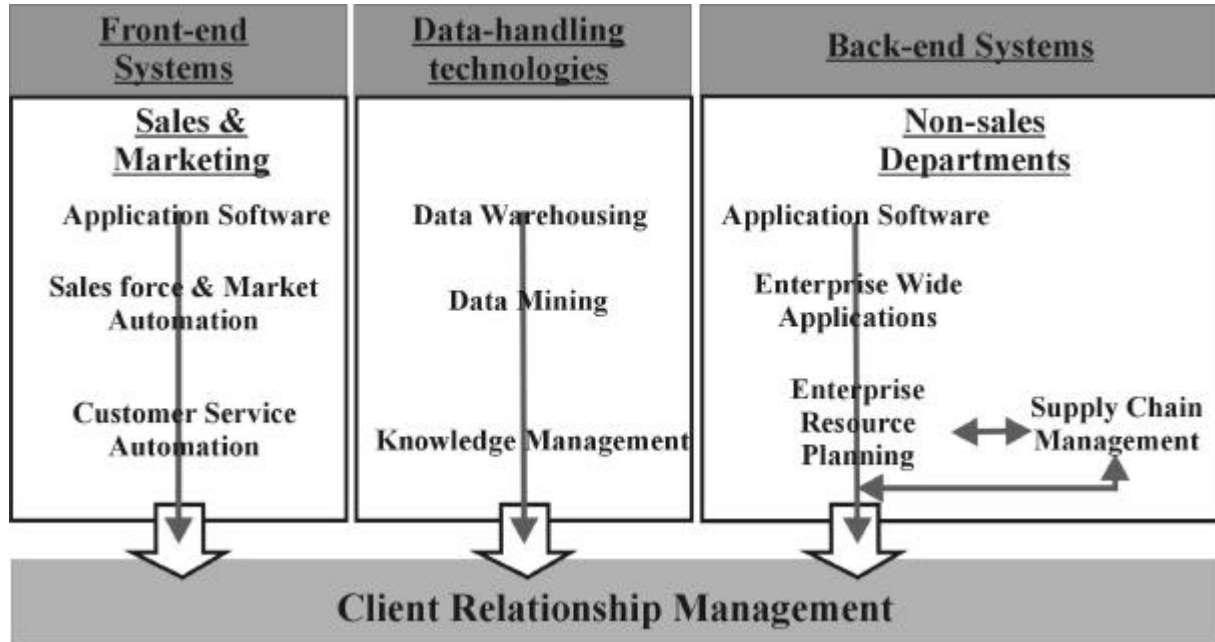
This paper is the first in a series trying to conceptualise the research domain that will attempt to answer the question: 'what are the critical success factors for CRM implementation: what are the fundamental requirements, elements and issues of CRM; and, who are in a position to implement CRM'? The purpose of this paper is to form a conceptual framework of CRM from an organisation perspective. CRM means different things to different people (Winer, 2001, Goodhue, 2002). The dominant view in the literature comes from the sales and marketing perspective. This perspective states that CRM is making the organisation customer centric, using new techniques and technologies, and making the customer an integral part of the organisation. The sales and marketing literature suggests that CRM is about getting to know your clients better through the use of technology. This is not in dispute in this paper. This paper instead suggests that very few authors are looking at CRM from the organisational requirements perspective, its technology, processes and people. Looking at the literature analysis undertaken by Romano (2001), and Romano and Fjermestad (2002), researchers have focused primarily on the sales and marketing perspectives of CRM. Few take the viewpoint of the organisation and its requirements, and fewer authors still make the connection between the preceding technologies, such as back-end and front-end systems, and CRM (Winer, 2001; Renner, 1999; Day, 2000; Chang, 2001; Petrissans, 1999, Lee, 2001). These links tend to be tenuous and not a single direct path towards CRM.

CRM is essentially gaining the most information, and ultimately knowledge, about a client. Data gathering is central CRM requirement, and as important are the integration of processes that gather that data. CRM is inclusive of the whole organisation including its internal and external environment and 'key processes must be internally integrated and externally aligned with the corresponding processes of the firm's customers' (Day, 2000), which suggests technology and processes are also central requirements of CRM. The technology and processes in an organisation can be seen as three distinctive requirements streams (Diagram 1): the front-end systems, the back-end systems and data-handling technologies, and 'a capability emerges from a complex interaction of many elements and will only be as good as the weakest link. Every element must be scrutinized for improvement' (Day, 2000). A simple warning, 'the promise of customer relationship management is captivating, but in practice it can be perilous' (Rigby et. al. 2002) meaning there is more to CRM than a simple software solution.

Using the literature we will discuss some of the preceding technologies, systems and processes essential to CRM. Some of what is discussed is physical, tangible, information systems and information technology and processes, for example: enterprise resource planning (ERP) and information communication technologies (ICT). Equally there are key intangible information systems and processes, such as strategy and planning, organisational theory and trust, process change, which needs to be discussed in further research of the literature. Like many other IS implementations CRM is about requirements engineering (RE). RE is about interpretation of processes and a construction of dialogue between analysts and client in any IS project (Thanasankit, 2002; Jirotko and Goguen, 1994). RE are all the activities of discovery, analysis, documentation, design and maintenance required for implementation of any IS project (Thanasankit, 2002; Thanasankit and Corbitt, 2002; Leffingwell and Karakostas, 2000; Sommerville and Sawyer, 1997). CRM is more than another IS project, CRM is a complex process which is driven by the requirements (needs) of the organisation and the customer. It is imperative that the development and implementation of CRM picks up on the requirements of both organisation and customer, and that these are wedded into the software developed so that the business processes required happen and realise value for the organisation and satisfaction for the customer. This means that the RE modelling represented in models like that of Loukopoulous and Karakotsas (1995) become just as important in the CRM process as well.

This paper is the beginning of research trying to conceptualise the three streams of information systems leading into CRM (Diagram 1). These three streams present their own RE challenges of discovery, analysis, documentation, design, and of-course maintenance, before they can be tied into a CRM project. First, the sales and marketing and the tangible technology and processes employed will be researched, rather than intangible customer centric focus discussed *ad nauseam* in the literature. Second, the back-end operations requirements leading to enterprise resource planning (ERP) and it's integration with CRM, an area insufficiently addressed in the literature. It is easy to establish a link between the descendants of the back-end to ERP, it is the discussion and research of the link between ERP and CRM that is lacking. Yet fundamentally 'CRM/ERP implementations are not atypical and indeed any company that has made a large investment in ERP should closely link CRM activities to that investment' (Chang, 2002). Thirdly, there is the data-handling technology, which is born out of the very womb CRM was born. Data warehousing, data mining and

knowledge management may have been around in some form or another for some time, but today their direct reason for being is born out of the CRM paradigm. CRM cannot exist without the data-handling technologies of data warehousing, data mining and knowledge management.



*Diagram 1: Three requirements streams for CRM.*

### **The Front-end Requirements.**

The front-end information systems are the direct descendants of existing CRM, and include sales force automation, market automation and customer service automation (Chang, 2001; Firth, 2002), refer to Diagram 1. Sales force automation gives an organisation's sales people, the traditional customer face of the organisation, the information systems based tools and techniques to better interact or perform their tasks. Market automation is the automation of information systems-based tools and techniques to allow marketing departments to better identify and target customers, more importantly segments of the market. Organisations also realise they have to engage the client as well. Therefore customer service automation brings the tools and techniques that allow the organisation, in the sales and marketing area, to interact with the customer. Customer service automation tools include call centres and sophisticated communication technology infrastructure, Web sites and e-commerce interfaces. These technologies will have an increasing significance to the organisation with the deployment of CRM (Petrisan, 1999).

A significant number of CRM projects have centred on the finance and investment industry (Korner and Zimmermann, 2000), where advisors and analysts have a need to understand their clients very intimately and provide advice that is critical to their client's investment portfolios. Research in this area tends to take the form of case studies centred on the sales and marketing perspective. There is a fundamental element missing in the literature, the link between sales force automation, market automation and customer service automation, the three key requirements, and how they are incorporated into CRM.

### **Data Gathering Requirement**

CRM is essentially gaining the most information, ultimately knowledge, about a client, and central to these requirements is gathering data. Data can include: shopping preferences and habits, levels of income, education, family status or size, a whole gamut of information about the customer can make up the data. Customer service automation does not do this alone. Customer service automation is basically the process of automating the services that interact with the customer. Data is collected on the transaction history with the customer in various forms (Schroeck, 2001). Every time the customer interacts with an organisation there is some data collected. In paper-based systems the data is collected using sales forms, purchase orders, invoices, and so on, but with automation information can be collected through direct communication and interaction channels, such as EDI, e-commerce, Internet, or even a mixture of manual and automated systems: for 'at the heart of the CRM solution is data. That data represents an organisation's customers. It is also vital to the success of a CRM effort that everyone has the same understanding and definition of "customer"' (Chang, 2002).

This discussion suggests that organisations have begun to analysis and understand their data requirements, and 'the more analysts study the systems under design and work or requirements, the more knowledge or systems requirements they need to gather to better understand the systems' (Thanasankit and Corbitt, 2002). Organisations have begun to invest in and automate their collection of data, which is central requirement of CRM (Berson et. al., 1999; Brobst, 2002) and 'the most effective way to create an integrated CRM environment is by implementing a customer data warehouse' (Schroeck, 2001). However, organisations also need a way of sorting and interrogating the data as well as making sense of it. These are the data-handling technologies of CRM (Diagram 1). These core technologies include: data warehousing, data mining and knowledge management. There is a fast developing body of knowledge and industry reports discussing these technologies. Essential for CRM systems to

operate data needs to be collected in to a central repository or a data warehouse. Data warehousing is a mix of technologies that manage data on two or more databases (database management systems being part of those technologies) allowing the data to be used for strategic purposes (Rud, 2001; Berson, et. al., 1999). Data mining provides the tools and techniques used to automate and manipulate data for detecting relevant patterns in a database (Berson et. al., 1999). Interpreting and using data is knowledge management, using the collective knowledge of your client.

Critical for successful CRM is that data mining 'needs to have relevance to the underlying business processes' (Berson et. al., 1999). This suggests that data about a client's interaction with an organisation does not only come from the sales and marketing area. Clients interact with various people and departments at various different levels. Client data does not simply appear. It has to be generated and collected from somewhere, the sales and marketing is only one source of data. The rest of the whole organisation contains a rich source of data on a client. While clients do have to interact with the sales and marketing departments, they also interact with most other functions of the organisation. CRM requirements goes beyond the physical and structural aspect of customer service and sales force automation, 'to realize CRM, organisation must foster behaviour – and implement processes and technologies – that support coordinated customer interactions throughout all customer channels' (Close, 2001).

The aim of this paper is to begin conceptualising CRM requirements for all organisations (or the 'vanilla' organisation), making it hard to demonstrate generalizable examples. We can however acknowledge all organisations have common functions, with the accounts receivable function common across all organisations. Customers interact with accounts receivable, which also collects a vast amounts of data about customers, such as: time taken to pay outstanding accounts, credit history, annual net and gross purchases, purchase volume history and so on. Some of the data collected in accounts receivable is shared with the sales and marketing department, but there is equally a lot of data that is not shared.

In product manufacturing and, or supply organisations inventory control, manufacturing and warehousing departments also interact with clients, especially if there are special orders or deliveries, picking errors or stock shipment errors, or when couriers are being organised to pick up stock. Inventory control and warehousing has to interact with clients to order and organise special or bulk orders and deliveries, or simply handle stock and delivery queries.

These interactions collect their own unique data profile of the customer and need to be part of the whole data picture of a customer for CRM. Client data in a CRM system is used by all who come in contact with a customer, and mainly by the sales and marketing areas underlining 'an important facet of a market-related capability is sharing knowledge with all employees who come in contact with customer' (Day, 2000). CRM is basically the endpoint of understanding requirements and interaction with customers to provide the customer with a high level of service they need, want and demand.

### **Back-end Requirements**

Therefore a high level of data integrity about a client cannot be achieved if the back-end operations are not working effectively; they feed into CRM like the front-end systems and data-handling technologies. Before organisations can achieve CRM implementation they have to achieve synergy and a high level of operational efficiency and effectiveness in the back-end operations (Diagram 1). A good overall CRM strategy can provide organisations with opportunities to integrate existing applications and technologies (Petrisans, 1999). There is a hierarchy of technology in the back-end operations as well (Diagram 1).

When organisations build an information system they start with software applications suited to unique or specific needs, for example: inventory control for inventory; accounts payable for debtors; payroll for human resources; bill-of-materials for manufacturing, and so on (Fiedler et. al., 1994). Organisations traditionally start implementing automated information systems based on identifying strategic areas of the organisation requiring new tools and techniques. There is considerable research, which this paper will not dispute, discussing organisations going through the next stage and linking these systems via enterprise wide applications (Fiedler et. al., 1994). Enterprise wide applications (EWA) are the linking of software application to interchange data between software applications and systems. When there is an inventory control system there is a need to link it into accounts payable to match supplier delivery dockets to their invoices, and so on, linking all the back-end applications. Ultimately 'having the required infrastructure in place significantly increase the speed with which new applications can be implemented to meet new strategies, thus increasing the firm's strategic agility and flexibility' (Weill and Broadbent, 1998), unfortunately many organisations are still grappling with establishing efficient intranets and enterprise wide applications, and have not yet achieved a satisfactory level of synergy between these to go to the next stage.

The next stage, enterprise resource planning (ERP), the final point in integrating back-end operations, which includes the sum of enterprise wide application integration, and another key factor, supply chain management. The supply chain, seen as a back-end system, crosses both front-end and back-end systems, organisations 'must strive for seamless, real-time integration both horizontally across customer-facing processes – such as marketing, selling and services – and vertically to back-end supply chain processes' (Renner, 1999). It is of little use automating and perfecting an internal system if the products or services are not produced and delivered efficiently and in a cost effective manner to the organisation. Supply chain management (SCM) is critical to ERP, essentially SCM is the planning of resources, and using those resources effectively so the supply to the customer is efficient and effective (Archer and Yuan, 2000; Janssen and Sol, 2000). For supply chains to integrate in to CRM and therefore be nimble and responsive, organisations must integrate and derive synergy with new electronic supply-chain technologies (e-commerce and Internet), as well strive to become 'customer-centric' (Renner, 1999), the fundamental driving force of CRM.

In the literature there is discussion of the hierarchy of steps leading to ERP, but there is no clear link made between ERP and CRM, with only a few authors hinting at the necessity of integration (Day, 2000; Shoemaker, 2001; Renner, 1999). ERP needs to achieve a high level of operational efficiency before an organisation can consider CRM. The underlying internal and external business transactions and documents trail, enabling the organisation to provide products, services and information requested by the customer is facilitated by the ERP system (Shoemaker, 2001), and 'ideally, these systems are integrated with one another' (Shoemaker, 2001).

### **Technology Requirement**

The discussion in this paper so far suggests that technology infrastructure is a key requirement of CRM. It is recognised that 'the increasing role of technology provides substantial benefit for both firms and customers' (Bitner, et. al., 2000). Technology is said to be an enabler, 'it is not a panacea. Enterprises have not "done" CRM because they installed a software package' (Close, 2001), meaning organisations need to take an integrated approach rather than building islands of technology throughout the organisation. 'IT infrastructure generally has been described as a set of IT services, including communications management, standard management, security, IT education, service management, application management, data management, and IT research and development' (Hwang et. al., 2002). Infrastructure forms



the foundation of information technology capability and needs to be delivered as reliable services from a centrally coordinated body to all parts of the organisation and must include technical and managerial expertise, both essential to the provision of reliable services (Weill and Broadbent, 1998). It is important to realise the size of the investment in information technology and systems relating to CRM. With the unstoppable move towards e-commerce making long term infrastructure investment decisions critical (Weill and Broadbent, 1998) and with the average US based CRM project investment approximately \$US3.1 million (Petrisans, 1999), and according to Forrester Research (cited in Rigby, 2002) the cost can be between \$US60 million and \$US130 million, makes CRM systems a considerable infrastructure investment. A significant factor that is impacting on technology is the increasing number of technology tools and their sophistication, 'although service encounters have traditionally been conceptualised as "high-touch, low-tech", the infusion of technology is dramatically changing their nature' (Bitner et. al., 2000), making 'the integration of a company's electronic, voice, and live access channels are paramount to providing an effective and efficient total customer experience' (Fienberg, 2001).

Technology is used to automate processes (Strauss and Frost, 2000), which are a delicate part of CRM, and need to be mentioned albeit briefly. CRM brings a new economy to the organisation and includes not only structural but also process related challenges and potentials (Kroner and Zimmermann, 2000). A process is a way an organisation does something, and if a process is errant and automated as part of CRM, all that is achieved is an errant processes automated (Close, 2001; Goldenberg, 2002), making technology and application selection almost secondary compared to the change to processes a large CRM project will bring to an organisation (Chang, 2002). Many executives are seduced by software solutions and 'often do not see the need for changes to internal structures and systems before investing in CRM' (Rigby et. al., 2002) failing to see the true requirements of an IS project, causing a loss of synergy between the many internal processes.

### **Further Discussion and Research**

CRM can be seen basically as a large amorphous blob, and will be seen as such by an organisation draining valuable revenue and resources if it is not handled correctly, and the three IS and IT streams of the organisation leading into CRM are not understood and integrated first. 'CRM packages are starting to extend tendrils to other parts of the organisation outside the traditional front office functions' (Chang, 2002) making CRM a

maze of cross discipline perspectives, with organisations, and researchers equally, needing to understand the fact that 'CRM is a complex, multifaceted discipline that involves rethinking and re-examining everything from technology and processes to the skills and abilities of employees' (Renner, 1999). 'Companies will gain the strategic and economic benefits associated with CRM by integrating their organisation capabilities – structure, processes, skills and metrics – into the added intelligence of CRM technologies to either confirm or change decision-making criteria' (Swift, 2001) meaning only through the integration of back-end, front-end and data-handling technologies efficiently and effectively, then this is CRM.

The next part of the research is to investigate the concepts outlined in this paper. 'Successful CRM depends more on strategy than on the amount you spend on technology' (Rigby et. al., 2002), meaning simply throwing software or technology at an organisation for CRM implementation will cause more problems than solutions. Further research will investigate the relationship between the front-end, back-end and data-handling technologies as shown in Diagram 1, to establish if organisations are achieving a level of synergy in integration between the three streams of information systems and technologies essential for CRM. In the process of writing this paper we have realised that requirements engineering discipline offers a valuable area of knowledge that will aid in answering the research question. RE concerns itself with IS development, deployment and maintenance, and CRM is another information system.

## References

1. Archer, N.; Yuan, Y.; 2000, "Managing business-to-business relationships throughout the e-commerce procurement life cycle", *Internet Research*, Vol. 10, No. 5, pp385-395
2. Berson, A.; Smith, S.; Thearling, K.; 1999, *Building data mining applications for CRM*, McGraw-Hill, USA
3. Bitner, M. J.; Brown, S. W.; Meuter, M. L.; 2000, "Technology Infusion in Service Encounters", *Journal of the Academy of Marketing Sciences*, Vol. 28, No. 1
4. Brobst, S.; 2002, "Data Warehousing from the Trenches: Your Business Strategy is Only as Good as Its Execution", *DM Review*, March 2002, DRReview.com
5. Chang, J.; 2001; 'CRM Suites for Medium to Large Enterprises', *The Customer Relationship Management Solutions Guide*, 3<sup>rd</sup> Edition, August 2001, CRMguru.com
6. Chang, J.; 2002, 'A Guide to Evaluating CRM Software', *The Customer Relationship Management Solutions Guide*, April 2002, CRMguru.com
7. Close, W.; 2001, "The Need for a Multi-Vendor Strategy in Achieving Outstanding CRM", *Defying the Limits*, Vol. 2, CRMproject.com, Montgomery Research, Inc.
8. Day, G. S.; 2000, "Managing Market Relationships", *Journal of the Academy of Marketing Sciences*, Vol. 28, No. 1
9. El Sawy, O. A.; Bowles, G.; 1997; "Redesigning the Customer Support Process for the Electronic Economy: Insights From Storage Dimensions", *MIS Quarterly*, December
10. Feinberg, R. A.; Trotter, M.; 2001, "Immaculate Deception: The Unintended Negative Effects of the CRM Revolution", *Defying the Limits*, Vol. 2, CRMproject.com, Montgomery Research, Inc.
11. Fiedler, K. D.; Grover, V.; Teng, J. T. C.; 1994, "Information technology-enabled change: the risks and rewards of business process redesign and automation", *Journal of Information Technology*, p267-275
12. Firth, D.; 2002, 'The Organizing Vision for Customer Relationship Management',

- [www.anderson.ucla.edu.au/acad\\_unit/info\\_sys/doctoral/davidfirth.htm](http://www.anderson.ucla.edu.au/acad_unit/info_sys/doctoral/davidfirth.htm), accessed 30/05/02
13. Goldenberg, B. J.; 2002, CRM Automation, Prentice Hall PTR, Upper Saddle River, NJ, USA
  14. Goodhue, D., L.; Wixon, B., H.; Watson, H., J; 2002, "Realising business benefits through CRM: hitting the right target in the right way", MIS Quarterly, Vol. 1, Issue 2, p74-94
  15. Hwang, H.; Yeh, R.; Chen, H.; Jiang, J. J.; Klein, G.; 2002, "IT Investment Strategy And IT Infrastructure Services", The Review of Business Information Systems, Vol. 6, No. 2, Spring 2002
  16. Janssen, M.; Sol, H. G.; 2000, "Evaluating the role of intermediaries in the electronic value chain", Internet Research, Vol. 10, No. 5, pp 406-417
  17. Jirotko, M.; Goguen, J., A.; 1994; Requirements Engineering – Social and Technical; CA: Academic Press
  18. Kalakota, R.; Robinson, M.; 2001, e-Business 2.0 – Roadmap for Success, 2<sup>nd</sup> Edition, Addison Wesley, Upper Saddle River, NJ, USA
  19. Korner, V.; Zimmermann, H.; 2000, "Management of Customer Relationship In Business Media – The Case of the Financial Industry", Proceedings of the Thirty-third Annual Hawaii International Conference on System Sciences, 2000
  20. Lee, D.; 2001, Four Steps to CRM Success, HYM Press, St. Paul, MN, source: CRMGuru.com
  21. Leffingwell, D.; Widrig, D.; 2000; Managing Software Requirements: A Unified Approach; Upper Saddle River, NJ, USA; Addison-Wesley.
  22. Loucopoulos, P.; Karakostas V.; 1995, Systems Requirements Engineering: Europe, Berkshire, UK: McGraw-Hill Book Company,
  23. Petrissans, A.; 1999, 'Customer Relationship Management: The changing economics of customer relationship', IDC and Gap Gemini, white paper, May
  24. Renner, D.; 1999, "Closer to the Customer: Customer Relationship Management and the Supply Chain", Montgomery Research Inc., Ascent Volume1, [www.ascet.com/documents.asp?d\\_ID=210](http://www.ascet.com/documents.asp?d_ID=210)
  25. Rigby, D.; Reichheld, F.; Schefter, P.; 2002, "Avoid the Four Perils of CRM", Harvard Business Review, Vol. 80, Issue 2

26. Romano, N. C. Jr.; 2001, "Customer relationship management research: An assessment of sub field development and maturity", Proceedings of the Thirty-fourth Annual Hawaii International Conference on Systems Sciences, 2001
27. Romano, N. C. Jr.; Fjermestad, J.; 2002, "Electronic Commerce Customer Relationship Management: An Assessment of Research", International Journal of Electronic Commerce, Winter 2001-2002, Vol. 6, No. 2
28. Rud, O. P.; 2001, Data Mining Cookbook, John Wiley & Sons, Inc., NY, USA
29. Schroeck, M.; 2001, "Customer Analytics Making the Difference in CRM: Customer Analytics Amplify the Value of Integrated CRM Solutions", DM Review, September 2001, DMReview.com
30. Shoemaker, M. E.; 2001, "A Framework for Examining IT-Enabled Market Relationships", Journal of Personal Selling and Sales Management, Spring 2001, Vol. 21, Issue 2
31. Sommerville, I.; Sawyer, P.; 1997; Requirements Engineering – A Good Practice Guide; England; John Wiley & Sons
32. Strauss, J.; Frost, R.; 2000, 'Customer relationship management', E Marketing, 2<sup>nd</sup> Ed, Prentice Hall, Upper Saddle River, NJ
33. Swift, R.; 2001, "The New Economic Opportunity for Business – Creating Increase Profitability through CRM", Defying the Limits, Vol. 2, CRMproject.com, Montgomery Research, Inc.
34. Thanasankit, T.; 2002, "Requirements engineering – exploring the influence of power and Thai Values", European Journal of Information Systems, Vol 11
35. Thanasankit, T.; Corbitt, B.; 2002; Understanding Thai culture and its impact on requirements engineering process management during information systems development; Asian Academy of Management Journal, Vol. 7, No. 1, January
36. Weill, P.; Broadbent, M.; 1998, Leveraging the New Infrastructure, Harvard Business School Press, Boston, USA
37. Winer, R. S.; 2001, 'Customer Relationship Management: A Framework, Research Directions, and the Future', working paper, Hass School of Business, University of California at Berkeley, USA.
38. Winer, R. S.; 2001, "A Framework for Customer Relationship Management", California Management Review, Vol. 34, No. 4, Summer 2001