IN SEARCH OF A MODEL FOR ASSESSING CRM DEMAND IN THE GOVERNMENT CONTEXT

Abstract
Motivated by the benefits claimed to have been achieved in the private sector, governments are seeking to implement CRM initiatives. The broad goals are to improve their services and minimize costs. Giving the wide range of CRM solutions and its high cost of implementation, government bodies will seek to tailor CRM solutions according to their needs and budgets. It is essential that this is done in a coordinated manner in order to avoid fragmentation of solutions. The basic principles of a model for assessing the need of CRM are presented. The model analysis involves strategic, operational, and cultural aspects.

Key words: CRM, e-government, customer relationship, cross-department integration.

1. Introduction

The current world is witnessing profound developments in the areas of Information Technology and Business Strategy. Embracing both areas, Customer Relationship Management (CRM) is becoming a major element of corporate strategy for many organisations throughout the world. Adopting CRM initiatives companies are improving their business and creating a sound and lasting competitive advantage adopting "relationship" as the word of order.

In order to implement relationship strategies and exploit their information technologies, companies are implanting and integrating CRM systems with their other existing systems and with their network channels. When well managed, these integrations are reputed to constitute a successful combination of technologies that provides the necessary resources to make possible the execution of the strategies that will situate a company in a very much desired position: closer to its customers. Getting closer to customers means that an organisation will be better able to know its customers' needs and wants; results that may be extremely significant and positive in terms of long-term relationship.

Following this trend, governments are aiming to provide better services and improve their relationship with citizens through the CRM solutions available in the market. Focusing initially on e-government initiatives, many agencies or departments are implementing CRM solutions for integrating different points or channels of citizen interactions in order to provide a seamless customer experience. A global study conducted by Deloitte Research has concluded that successful e-government will focus on the citizens as customer to build long-term relationship (CMA Management 2000). In its early incarnation, e-government has arguably been fulfilling the emergent service-to-the-citizen movement (Temin 1998).

Unfortunately, difficulties still lie in the way of any initiative to develop relationship management through the adoption of new technologies in a government context. CRM adoption involves, directly or indirectly, a broad number of organisational aspects and issues such as data privacy, data sharing, strategic planning, marketing planning, cultural barriers, legacy systems integration, cross-departmental processes integration, and reengineering. Specifically approaching the problems, the applicability of CRM concepts and systems in the government context deserves a deeper observation and study. Accordingly, the main purpose

of this paper is to focus on the analysis of the suitability of CRM systems in government context involving strategic, operational and cultural considerations within the scope of customer relationships.

In the next sections we will expand and delineate the general area of the subject and to point out the main problems related to the implementation of CRM in public sector. We will also present and describe the basic principles of a proposed methodological model for assessing CRM demand in the government context, the model is being tested in a research that is being conducted within the context of local authorities in UK. In the conclusion section we will comment on the model limitations and some future research that can be derived from the subject.

2. What is CRM all about?

Customer Relationship Management (CRM) is a fast growing area of business that is becoming a major element of corporate strategy for many organisations throughout the world. The confluence of changing customer demands, emerging marketing theories, and available information technologies have been imposing a shift on the way organisations relate to customers. CRM systems are supposed to provide the functionality that allows an organisation to make its customers the focal point of all departments within the firm. The roots of CRM trend are basically: (i) the organisation-level sharing, computing, and control of data; (ii) the emergence of powerful databases and information analysis tools; (iii) the rise of direct response, data based marketing, and integrated marketing communications; and (iv) a new awareness that marketing is relationship-oriented instead of transaction-driven (Kandell 2000). Organisations successfully implementing CRM are claiming higher prices and margin, faster growth rates, lower customer turnover, and increased market share (Silverman 2001). CRM provides seamless coordination between all customer-facing functions. Hence, productivity enhancement can be achieved by customer-facing personnel being able to do customer-related work more quickly and less painfully since they no longer have to re-type customer information several times and do not have to look up a customer's overall dossier in multiple computer systems (Goldenberg 2002).

The range of CRM solutions is very broad and may involve integration and improvements in information and communication technologies, including: (i) integration of computer telephony that supports call centers' activities such as voice recognition for directing calls and matching calls against names in a data base; (ii) Customer self-service websites that allow customers themselves conduct online transactions such as search for relevant information, download forms and software, request services or goods; (iii) the improvement of business intelligence using segmentation and analytical tools that identify customers patterns and needs; (iv) the implementation of mass customization processes through which goods and services are individualized to satisfy specific customers needs (Pang & Norris 2002).

CRM is not just a set of software applications and information technologies integrations, but a business strategy that focuses on building customer service excellence (Elliot 2000). In spite of its strong link with marketing, the implementation of CRM strategy is not just the responsibility of marketing department or other customers service sectors. According to Lin and Yen (2001), CRM is a wide business strategic process that involves the organization as a whole, spanning across different business functions. Kandell (2000) describes CRM business

approach as the use of technology to identify, interact, and track every transaction with individual customers, developing a learning relationship. Indeed, each customer interaction produces extensive data that can be stored in a database. In general, the purpose of CRM systems is to make inferences over this database in order to promote the achievement of organizational benefits such as: building customer loyalty, raising customer profitability, retaining existing customers, acquiring new customers, improving customer lifetime value, raising customer satisfaction, executing faster services, and improving sales force effectiveness.

3. CRM in the government context

The application of CRM systems in government context is seen as a strong initiative to promote the proximity between government and citizens (Hoenig 2001). Expanding on this, Heeks (2001) comments that the relationship with government goes beyond service needs and this aspect requires the implementation of new technologies and strategies in order to actually promote government relationship. This is one of the reasons why CRM initiatives are being considered as a next stage of government technological and managerial development (Sood 2001).

In fact, governments are seeking to implement CRM in order to enhance their relationship with citizens and promote cognisance of public opinion. Adopting one-to-one responses at every citizen point of interaction a government would be able to achieve the following benefits: (i) when interacting face-to-face, service representatives could have the citizen intelligence to recommend the programmes and services that best help the citizen; (ii) service representatives could respond citizen calls for service with personalised actions; (iii) departments could personalize content of their web site visitors and lead people to the programme and services they are most likely be interested in; (iv) when designing programmes, departments would be able to know which of their many potential participants were most likely to enroll and be successful in these programmes (SPSS Executive Briefing 2000).

The meaning of "customer" for government embraces all government stakeholders, namely: citizens, businesses, suppliers, non-governmental organisations, other government bodies, employees, and communities associations. Governments are the largest service provider in the world and they are becoming increasingly aware of the need to become more responsive to their customers (Shine 2002). It is increasingly difficult for citizens to understand how they can buy goods and services in a couple of mouse clicks and they have to stand in a queue for hours to renew their driver's license (SPSS Executive Briefing 2000). Governments are aware of this external pressure and trying to respond to such a social expectation, besides, they are also using new technologies to improve their operational efficiency and minimize their costs. For instance, it is already possible to conduct online a series of government processes such as paying taxes, getting a passport, voting, submitting forms, etc (Neff & Kvandal 2001). In order to achieve the benefits described in Table 1 below, the UK central government has set the target that 100% of services should be available online via e-government or other electronic means (NAO 2002). CRM systems can play an important role within this context, allowing government to track a customer through a number of interactions whatever is the channel of contact and enabling government to develop cross-departmental activities. Shine (2002) warns that CRM techniques and principles must be integrated into e-government implementations since the beginning.

Table 1 – e-government potential benefits.

BENEFIT	DESCRIPTION
GREATER CHOICE	Providing citizens with a greater range of services and delivery channels such as the Internet, call centres, and face-to-face contacts.
BETTER ACCESSIBILITY	Giving citizens greater access to the range of services delivered by departments by providing better, easier to use online information and joining up services at the point of delivery.
MORE CONVENIENCE	Providing services in a way that enables public to obtain information and carry out transactions with departments in a 24 hours 7 days a week basis.
FASTER DELIVERY	Enabling public to obtain and provide information more quickly than by post or by visiting a government office.
IMPROVED EFFICIENCY	Replacing manual processing by IT systems should reduce staff requirements and deliver financial savings or allow staff to be redeployed to other priorities.

Source: NAO Report, 2002.

4. The main challenges for implementing CRM

CRM is one of many technologies that were touted as panacea in a way that led to excessive expectations and a high rate of implementation failure. Industry surveys show that approximately 60% of CRM implementations fail the first time (Silverman 2001). A close examination of the problem reveals that CRM technologies embrace a wide range of processes such as product configuration, field service, customer service, and customer analysis (Reddy 2001). In other words, CRM is an extremely broad solution area that involves several subcategories of solutions and hundred products and services that focus a wide range of business problems and opportunities.

Reddy (2001) comments that lack of executive sponsorship, too much organisational change, and mismatched technology infrastructure are cited as usual suspects for CRM implementation failures. However, he argues that these symptoms are not in the root cause of failures. Instead, the main cause of failure is the lack of an actionable CRM strategy. Strengthening this latter argument, Silverman (2001) argues that CRM can be highly effective if it were implemented in a strategic, focused, and holistic manner. The broad but fragmented universe of CRM applications may mislead organisations to implement CRM solutions. Addressing this problem Payne (2002) comments that many organisations are adopting CRM solutions in a fragmented basis through a range of activities such as help desks, call centres, direct mail, etc. and these activities are often not properly integrated.

Turning to government context, Harris (2001) affirms that CRM in government is in its infancy and the industry has not proven that it is totally ready to deploy CRM solutions in a government basis. Implementing CRM can cost millions and the government should be aware that what works for other organisations will not necessarily works for it. Shine (2002) points out that there are no models for government agencies to follow. He claims that given the scarcity of public-sector best practices, government executives are testing out private-sector concept of CRM, even though the two sectors have different goals, and paradigms such as "customer value" and "customer profitability" have no place in a government with a mandate to serve everyone equally.

Regardless the problems commented above, government departments are deploying CRM initiatives to support their activities and trying to achieve the CRM claimed benefits. Government executives that have successfully implemented CRM solutions affirm that the need for CRM will not go away, contrarily, it will grow because its principles support government's mission. However, experts caution departments to define CRM technology in the light of their own particular needs. This behaviour can concentrate the solutions in fragmented silos and maximize investments.

From the aspects above, we can see that the growth of CRM and its move into public sector raise a series of issues. There is no "one-size-fits-all" CRM solution for anyone; contrarily, government departments need to tailor CRM solutions according to their needs and budgets. However, this should be done in a coordinated manner in order to avoid the fragmentation of solutions and its negatives consequences. Two of the main departmental challenges are: (i) how can a department measure its demand for CRM solutions? (ii) Do the department's processes that demand CRM solution match the department's strategic orientations? For answering these questions, a new methodological model termed "CRM Grid" is suggested in the next section. The analysis of the model's outcomes involves strategic and operational issues. Besides, its interpretation considers cultural aspects that might constitute barriers that can negatively influence the implementation of CRM solutions.

5. The proposed model CRM Grid

5.1. The contextual basis that led to the model

The UK National Audit Office (NAO) –an entity that scrutinises public spending on behalf of Parliament– has carried out an examination of what government departments are doing to achieve the benefits of e-government initiatives, and how they are managing the risks of implementation. According to the NAO report (NAO 2002), some of the main risks that government departments need manage are:

- If departments do not grasp the organisational, cultural and technical changes needed to harness the benefits of modern technology, improvements in working practices will not be realized. Their services will not match citizens' expectations and they will waste taxpayers' money by continuing to use outdated forms of service delivery.

- There is a tendency for departments to concentrate too much on technological aspects rather than consider the wider implications, particularly the opportunities that IT offers to reengineer existing procedures.

- Departments often do not adopt a sufficiently strategic approach to IT.

- Suppliers provide IT solutions that do not meet departments' expectations, and unduly influence departments to accept ready and not suitable solutions.

- Assumptions about customer demand for electronic services are uncertain.

- Demand for services does not match forecasts used in the business cases to support IT implementations. As a result services are over or under used.

- Departments develop IT systems independently, which makes it more difficult for them to share information and provide joined up services and take advantage of the collective purchasing power.

The problems above address a series of problems that go beyond the normal scope of e-government. From the list above we can infer that government departments are basically having difficulties: (i) to consider strategic issues when analyzing the allocation of new technologies; (ii) to obtain accurate insights about customer demand for automated services; (iii) to measure the department's demand for a new technology; and (iv) to analyze the deployment of new technologies in a coordinated manner.

The same NAO report (NAO 2002) provides a series of recommendations that departments should follow in order to minimize the risks raised previously. Some of the recommendations are:

- Key decisions on IT systems are business decisions not technical ones and should involve senior management.

- Suppliers should not be allowed to lead IT projects; departments should have sufficient knowledge and expertise to assess any change in the project proposed by suppliers.

- It is important to analyze the options for meeting the business objectives to ensure that the preferred option value for money and is supported by users and key stakeholders.

- It is clearly important that business cases underpinning investment in IT are well-researched and practical implementations issues adequately addressed.

- To minimize the risk of IT solutions not meeting needs, departments should firstly be much clear about what their requirements are. This should involve much more research and analysis early on.

From the recommendations above we can see that the decisions for adopting IT solutions in government should be conducted in an holistic manner by senior managers, who have a wider and strategic view of the organisation, are able to consider issues involving different stakeholders, and can make strategic decisions involving cross-sectors processes. Such behaviour would rationalize public spending and enhance the chances of successful implementations.

Other risks involved in the implementation of new technologies in government context are related to cultural aspects. Margetts and Dunleavy (2002) warn that different organisations may have different responses to the possibilities that the new technologies provide, i.e., since organisational values might work against the development of electronic services we can

expect that some cultural aspects may lead to distinctive barriers to the implementation of IT. In addition, Heeks (2000) comments that different governments may have different viewpoints about public information accessibility, and some of these viewpoints may create access barriers to public. For instance, the view that public data should only be used for supporting public staff activities may constitute a barrier for public access.

In order to obtain initial insights regarding the issues commented upon so far, we have contacted some senior officers from different UK local authorities. A group of 10 officers from the Councils of Manchester, Preston, Salford, and Trafford have answered a questionnaire that addressed issues about their stage of e-government development, their main strategic role, the main focus of their processes, and their viewpoint about data accessibility. The main insights provided by the group were:

- Their volume of operations via the Web is growing and they are not satisfied with the performance of their on-line processes. They are keen to make additional investments in IT and to restructure some of their processes.

- The departments whose customers demand low level of interaction have their processes mainly focused in internal administrative procedures.

- Those departments that have more diversified customers, demand more cross-departmental processes and more flexible channels of customer interaction.

- Issues regarding data ownership and value/charging are relevant aspects in determining the approach taken to data accessibility.

The assertions above are not answers for the issues addressed in this paper. Instead, they are basic points related to the subject and its context. There is still a lack of a methodological procedure for approaching, analyzing and interpreting the aspects commented so far in an integrated manner. Thus, the idealization of a method that combines organisational strategic and operational issues concerning customer relationship would be very helpful for providing relevant insights regarding the demand for CRM initiatives. The analysis of the results produced by such method should involve cultural aspects and the comparison of different departments results enables a coordinated approach of the problem.

5.2. Interpreting the CRM Grid model

The proposed CRM Grid is an interpretive scoring method for helping senior officers or managers measuring and analyzing CRM demand in their context. The proposed model is mainly grounded on strategic management theory and it is based on the principle that an organisation's strategic goals establish the organisation's purpose, setting out the directions and scope of the organisation's operations or processes. Moreover, suitable goals should be relevant to the organisational mission, which states the broad directions that an organisation wishes to follow and contains a broad indication of the organisation's offers and customers (Finlay, 2000).

The main logical idea that underlies the CRM Grid model is that, theoretically, departments define and implement their operational processes according to their strategic goals, i.e., the processes are the way for reaching the goals, which, by their turn, are aligned with the department's mission, which in a higher level delineate the department's offers and customers. Therefore, different customers may require different ways and levels of interactions in order to satisfy their needs when searching for a department service. Thus, considering the way a department relates with its customers, some of its processes can have "special characteristics" that make them "eligible" processes for being automated by CRM systems or tools; such a "special characteristics" means that the processes have functionalities to allow any sort of relationship with customers –personalized interactions, customers segmentation, customers analysis, etc. The suggested model intends to measure two dimensions of a departmental focus towards its customers: strategic and operational aspects. A department's strategic aspects towards its customers are "demanding factors" for CRM business approach, and the demanded processes established by strategic orientations towards customers are "eligible" processes for being automated by CRM applications. A graphic view of the CRM Grid is shown in Figure 1 below.

Figure 1 – The CRM Grid
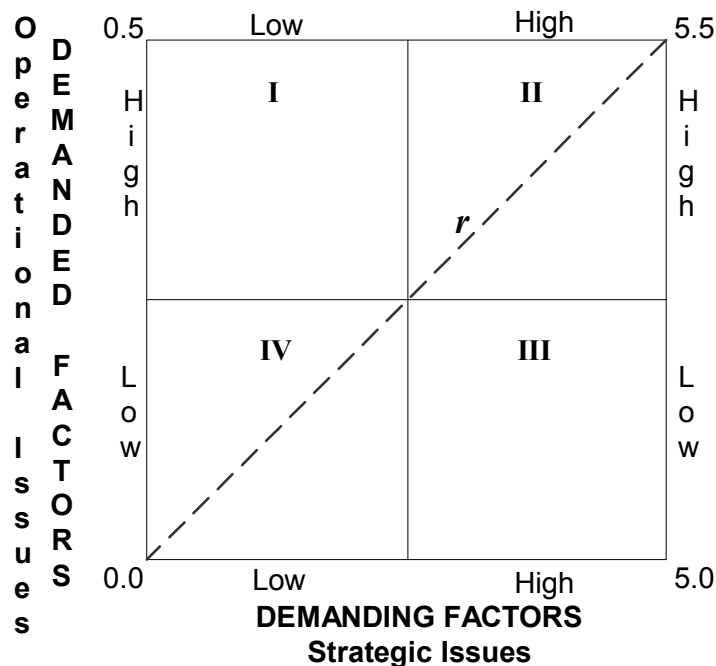
As we can see in Figure 1, the CRM Grid has two scales, one that measures "demanding factors" for CRM business approach and another that measures "demanded factors" that require CRM solutions. The combination of these two scales produces a measurement in a format "X.Y" where "X" represents the measurement of the "demanding factors" and "Y" represents the measurement of the "demanded factors". The placement of the measure X.Y within the CRM Grid allows government managers to grasp a quick view about the department position regarding CRM adaptability. The more customer-focused a department's strategy, the higher the measure in axis "x", as well as the more customer-integrated a department's operations, the higher the measure in axis "y". Measures close to the diagonal "r" suggest a balanced situation between strategic and operational aspects, i.e., a

department's strategy is supported by its operations. Contrarily, measures off the diagonal suggest strategy unsupported by the operations or vice-versa.

The measures for the axis "*x*" (strategies) and "*y*" (operations) are rates that can vary from "0" (lowest rate = less customer-oriented strategies or processes) to "5" (highest rate = more customer-oriented strategies or processes). The CRM Grid position "X.Y" can vary from "0.0" (a department is less CRM adaptive) to "5.5" (a department is more CRM adaptive) and the correlation coefficient "*r*" can vary from "0" (high discrepancy between strategic and operational factors regarding customer relationship) to "1" (well balanced strategic and operational factors regarding customer relationship).

The CRM Grid can be proposed as a helpful managerial tool for supporting managerial decisions regarding government investments in CRM systems and strategic/operational adjustments. The different grid quadrants or cells convey different aspects about a government agency or department regarding its customer relationship strategies and operations. For instance, when a CRM Grid measurement falls in:

i.   *Quadrant I*: it indicates that a department has low customer-focused strategic aspects. However, most of its processes are executed for supporting customer interactions. This fact suggests that strategic goals might not be well defined, or employees are distorting strategic goals. This situation might require redefinition of strategic guidelines or reengineering of processes. It also might indicate managers' cultural barriers regarding customers' access to information.

ii. *Quadrant II*: it indicates that a department has high customer-focused strategic aspects supported by high customer-orientated processes. This fact suggests that CRM solutions are very applicable to the context; thus, giving the high demand for CRM, investments in broad range of CRM solutions can be fully justifiable.

iii. *Quadrant III*: it indicates that a department has high customer-focused strategic aspects. However, most of its processes do not support customer interactions. As in quadrant I situation, this fact suggests that strategic goals might not be well defined, or employees are distorting strategic goals. This situation might require redefinition of strategic guidelines or reengineering of processes. Differently from quadrant I, this case in quadrant III might indicate employees' cultural barriers regarding customers' access to information.

iv. *Quadrant IV*: it indicates that a department has low customer-focused strategic aspects and low customer-orientated processes. This fact suggests that a department does not have high demand for CRM solutions. Therefore, a few components of CRM systems are enough for providing the department CRM needs; moreover, investments in broad range of CRM solutions are not justifiable in this situation.

In resume, even quadrants (II and IV) show a fairly balanced department's strategies and processes. Departments in quadrant II require higher investments in CRM than departments in quadrant IV. The odd quadrants (I and III) show unbalanced department's strategies and processes, suggesting redefinition of strategic guidelines or reengineering of processes. These latter situations deserve further analysis involving cultural issues, since quadrant I might

indicate managers' cultural barriers regarding customers access to information and quadrant III might indicate employees' cultural barriers regarding customers access to information. Therefore, it would be important to find out what is a department viewpoint about government data accessibility comparing managers and employees viewpoint.

6. Conclusion

The CRM Grid model is limited to showing organisational balance or discrepancy between strategic and operational aspects regarding relationship with customers. It does not show what kind of CRM solution a department requires. Such analysis should be done but beyond the CRM Grid's scope. Besides, the explanation of discrepancies between strategic and operational aspects is limited to the observation of the cultural aspect of government viewpoint about data accessibility, which not necessarily is the unique cultural aspect that may constitute cultural barriers towards CRM initiatives. We think that future research could involve other cultural aspects such as government viewpoint about customer data privacy or government attitudes to the new technological environment. The issues of cross-department integration and integration with legacy systems also constitute potential fields for future researches regarding CRM or e-government subjects.

The suggested model is not tested yet; its practicability is being studied in a research that is being conducted in three different UK councils. The research's findings can contribute for a better understanding about the applicability of CRM systems in government context, as well as can contribute for optimising CRM implementations according to the government needs and focuses, avoiding overestimations or underestimations of demands, and, consequently, rationalizing cost and time. Thus, different approaches for implementing CRM could be suggested according to a government context. The definition of scientifically based methods and managerial tools such a the CRM Grid also allows main government administrators to analyze their demand for CRM systems in a coordinated manner since they will have an instrument that provides a basis for comparisons involving different department's CRM Grid score. Furthermore, the investments can be made in a rational manner, since the main strategic administration body of a council will be able to distribute CRM solutions according to each department's degree of CRM demand. The findings can bring significant contributions for solution providers as well, once they will have an instrument that can help them to offer CRM solutions according to the level of CRM utility found in different government agencies or departments.

Future papers will comment the findings of the research that is being currently conducted. We recommend the replication of the CRM Grid interpretive scoring method in future researches within different government environments in order to improve its practicability and potentialities as a managerial tool.

References

CMA Management. (2000) *The Citizen as Customer*, December, Volume 74, Issue 10, p58.

Elliot, Monica. (2000) *CRM Software: Old Hat or New Trick?* IIE Solutions, November, http://solutions.iienet.org.

Finlay, Paul. (2000) *Strategic Management – An Introduction to Business and Corporate Strategy*, London: Financial Times Prentice Hall.

Goldenberg, Barton. (2002) *Barton Goldenberg's Advice: The Truth about Customer Relationship Management*, May, www.crmcommunity.com.

Harris, Shane. (2001) *Red Tape Carpet*, Government Executive, September, Vol. 33, Issue 12, p48.

Heeks, Richard. (2001) *Understanding e-Governance for Development*, i-Government Working Paper Series, Paper No. 11, Manchester: Institute for Development Policy and Management.

Heeks, Richard. (2000) *Government Data: Understanding the Barriers to Citizens Access and Use*, Information Systems for Public Sector Management Working Paper Series, Paper No. 10, Manchester: Institute for Development Policy and Management.

Hoenig, Christopher. (2001) *Beyond e-Government*, Government Executive, November, Vol. 33, Issue 14, p49.

Kandell, Jackie. (2000) *CRM, ERM, One-to-One – Decoding Relationship Management Theory and Technology*, Trusts & Estates, April, Vol. 139, Issue 4, p49.

Ling, Raymond and Yen, David. (2001) *Customer Relationship Management: an Analysis Framework and Implementation Strategies*, Journal of Computer Information Systems, Spring, Vol. 41, Issue 3, p82.

Margetts, Helen and Dunleavy, Patrick. (2002) *Cultural Barriers to e-Government*, Report HC704-III, April, National Audit Office, London: The Stationary Office.

NAO - National Audit Office Report. (2002) *Better Public Services Through e-Government*, Report by the Comptroller and Auditor General, Report HC704-I, April, London: The Stationary Office.

Neff, Dianah and Kvandal, Scott. (2001) *Connecting Citizens to Government Online*, San Diego Business Journal, 6th April, Vol. 22, Issue 23, p14.

Pang, Leslie and Norris, Robert. (2002) *Applying Customer Relationship Management (CRM) to Government*, The Journal of Government Financial Management, Volume 51, Issue 1, p40.

Payne, Adrian. (2002) *"Service Profit Chain": Link Between Employee, Cost and Profitability*, Key Note addressed to the inaugural Meeting of the Customer Management Foundation, London, www.crm-forum.com.

Reddy, Ram. (2001) *Through a Lens Smartly*, Intelligent Enterprise, March 27, Vol. 4, Issue 5, p66.

Shine, Sean. (2002) *Building Customer Relationship Management in Government*, Accenture Insights, The Government Executive Series, January, Issue 6, www.accenture.com.

Silverman, Robert. (2001) *CRM Dichotomies*, Intelligent Enterprise, May 24, V4, Issue 8, p90.

Sood, Rishi. (2001) *E-Gov Initiatives Aim to Empower Citizens – Savvy solution providers can play a critical role in government's transition online*. VARbusiness, January, No. 22, p91.

SPSS Executive Briefing. (2000) *Making e-Government a Reality*, White Paper EGOVWP-0700, www.spss.com.

Temin, Tom. (1998) *Government Agencies: Different Mandates, Common Goal – Customer Responsiveness*, Government Computer News, January 12, Vol. 17 No. 1, pS4.