A FOUNDATION ASSESSMENT OF THE INFLUENCE OF IT MANAGEMENT PRACTICES ON CUSTOMER RELATIONSHIP MANAGEMENT (CRM) IN A LARGE AUSTRALIAN FEDERAL GOVERNMENT AGENCY

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ABSTRACT

There is currently a thrust in Australia to move to whole of e-government. At the centre of this initiative is the need to ensure high quality customer relationship management (CRM). There is a paucity of research into CRM in the public sector and this research breaks new ground by exploring the level of customer relationship management (CRM) implementation in a large Australian Federal Government agency. Using a quantitative survey approach, data were collected through the distribution of an electronic questionnaire to IT heads of 23 departments in one large Australian Federal Government agency. The main finding of the research is that although a few of the departments have implemented CRM at the highest level, the majority of the departments are still in the lower levels of CRM implementation. Differences in IT management practices and their impact on CRM status are also measured and their impact on CRM implementation is discussed. Finally, recommendations for moving to more advanced stages of CRM implementations are made.

INTRODUCTION

In developed countries, governments are now faced with increasing political and community pressure to provide efficient and cost effective services (Kolsky & Keller, 2001). This has created a goal of working towards e-government whereby there will be seamless interactions and transactions between government departments, agencies and clients. As a result, customer relationship management (CRM) is receiving considerable attention because it underpins the thrust of these institutions to move to whole of e-government (Armstrong, 2002). More specifically '…(i)t can assist in, among other benefits, streamlining government processes, improving inter-agency data sharing and providing self-service options to the public' (Accenture 2002:18).

According to Batista and Kawalek (2004:128), 'CRM can be understood as a broad business strategy that implies the redevelopment of organisational structures so that there are new service units and new product offerings arranged around a refreshed understanding of customer needs'.

Customer relationship management, (CRM), albeit in different forms, has long been employed by for-profit organisations to build customer loyalty and support to assure repeat business. In the context of the modern business environment CRM has been facilitated by information and communication technologies (ICTs). In more recent times CRM has not been limited to for-profit organisations. It is becoming an increasingly imperative issue for government not only in Australia, but also throughout the world (Accenture 2004; Chadwick & May, 2003; Marche & McNiven, 2003).

However, despite the importance of implementing CRM, many of the current infrastructures and processes in some government departments are inhibiting CRM from becoming a reality (Accenture, 2002). This situation provides a basis for this research. It is designed to explore the current level of CRM implementations and the influence of IT management practices in the public sector and specifically within one large agency within the Australian Federal Government.

Accordingly, two research questions are posed:

1. What is the current level of CRM implementation in departments of a large Australian Federal Government agency?

2. What IT management practices impact on the level of CRM implementation?

This research extends earlier work into the topic of CRM in the private financial sector in the USA conducted by Karimi, Somers and Gupta (2001). The perceived benefits of using this reference research are that it provides an available validated survey instrument and a customer service topology of CRM adoption in the private sector that can be tested in the public sector. The current research also took an innovative approach by cross validating the topology through a discriminant function analysis of the customer service topology.

BACKGROUND

Historically CRM has a foundation in the era prior to1960, when direct selling was used to enlist and support customer loyalty based on personal attention. During the 1980s, advances in technology helped companies narrow their efforts by using target marketing. However, further deregulation of the market and the lack of coordination of channels and multiple messages being received about

different products from the same companies only added to the complexity of decision-making and the confusion experienced by the customer (Ling & Yen, 2001). In addition, during this period the focus was on individual sales and not on the individual customer (Dibb & Meadows, 2001).

The CRM era that commenced in the 1990s has seen a technology-enabled return to the direct sales era and a focus on the customer while still using the mass production and distribution systems that evolved through the intervening eras (Ling & Yen, 2001 Corner, Hinton & Kay, 2003). Modern information communications technology (ICT) now provides the capability to service customers with personalised goods and services. It provides the means of addressing the labour intensive aspects of storing, upgrading and retrieving the profile and personal preferences across a wide range of very different customers (Goodhue, Wixom & Watson, 2002) and enables functions not previously available (Cenfetelli, Benbasat & Al-Natour, 2005).

More so than ever before, CRM now affords for-profit organisations the ability to 'establish, nurture and sustain long-term customer relationships' (Winer, 2001:89). In this context the notion of lifetime customer value (LCV) has emerged as an important outcome from the implementation of CRM (Winer, 2001). LCV provides the ability to assess customers in terms of the current and future profitability they can bring to the organisation. It also enables the opportunity to identify where additional profits can be gained from customers (Winer, 2001).

From this background, it is evident that to date an overwhelming majority of the literature relates to CRM in the commercial business environment. Within this context, research has been conducted by consultants and has focussed on the bottom line and the relationship between CRM and increased revenue and profits (Goodhue, Wixom & Watson, 2002; Rigby, Reichhald & Schefter, 2002; Swift, 2002).

The increasing importance of CRM in public sector organisations

CRM is no longer exclusively the domain of for-profit business activities. Technology facilitated CRM is now also becoming an essential component in government (Batista & Kawalek, 2004; Accenture, 2003; NOIE, 2003). The driving force is the need to streamline large bureaucratic institutions. In particular public institutions are now more accountable in the cost and quality of the services they provide. Since citizens are stakeholders, expectations of fairness, integrity and responsiveness are high (Price & Brodie, 2001). In terms of equality this also implies servicing the needs of citizens regardless of whether they live in regional or rural areas.

The use of ICT provides a means to capture personal profiles of clients in relation to their specific needs, behaviours and preferences. This information can be used to assure clients that they are being provided with a personalised service, even though Federal Government departments/agencies are actually servicing a very large number of clients with a wide range of requirements. The technology underpins the current aim of government to have seamless interactions and transactions working towards whole of e-government. While CRM is pivotal to enable the achievement of these initiatives, (Kolsky & Keller, 2001) it has been suggested that currently the move towards the desired outcome is being inhibited by the infrastructures and processes within some Australian Federal Government departments (Accenture, 2004; Clarke, 2003). This implies that until enterprise transformation, including associated management practices, are implemented the goal of collaborative CRM at the highest level cannot be achieved (Radcliffe, Kirby & Thompson, 2001). Due to the relatively recent adoption of CRM within a government context very little research has been reported on this issue.

Stages of CRM Development

Table 1 provides a framework of the three stages of CRM (operational, analytical and collaborative) proposed by Karimi, Somers & Gupta (2001). In addition, it summarises the scope of the issues involved in each stage. This framework was constructed with reference to CRM literature and the work of Malhotra (2000), Goodhue, Wixom & Watson (2002), Chadwick & May (2003) and Croteau & Li (2003).

Stage 1, Operational CRM, is the first step an organisation takes towards the implementation of CRM. It involves individual applications aimed at the process level that are typically not co-ordinated within the organisation. This implies that the infrastructure is at a localised departmental level and there are a limited number of users (Goodhue, Wixom & Watson, 2002). At this stage the focus is on low cost that can be linked to the bottom line via productivity improvements.

Stage 2, Analytical CRM, involves the implementation of a dedicated CRM infrastructure to facilitate the scrutiny of customer and market databases. This provides the means to better allocate resources (Rigby et al., 2002; Xu & Walton, 2005). While this stage involves the implementation of a dedicated infrastructure across the business (Goodhue, Wixom & Watson, 2002) it is often provided to automate or consolidate existing business practices and processes.

Stage 3, Collaborative CRM, involves organisational transformation and is the most expensive and risky stage. Transformation implies change in the organisation as new business practices and applications centred on the customer are put in place (Goodhue, Wixom & Watson, 2002). Within this products and services are personalised to meet the needs of individual customers. Transformation also encompasses non technical issues such as organisational culture.

Table 1 provides a comparative summary from a number of areas relative to CRM within each of the stages.

Areas	Stage 1 Operations	Stage 2 Analytic	Stage 3 Collaborative
Infrastructure	Localised departments	CRM infrastructure	Organisation transformation
Sponsorship	Departmental level	Corporate IT	Top management involving all levels of the organisation
Applications	Multiple individual	Many individual	New to support changed business practices
Data	Limited in scope & volume	Large from a disparate source of systems	Changing data infrastructure
Users	Limited (small group)	Growing user base	Nearly all personnel involved
Benefits	Productivity improvements: greater local revenues and profits	Cost savings from infrastructure consolidation	Potential for great increases in revenues and profits
Cost	Low	Medium-high	Expensive
Risk	Low	Medium	High

Table 1: Scope of the 3 stages of CRM (Karimi, Somers and Gupta, 2001)

Customer Service Topology

Karimi, Somers and Gupta (2001) also established a customer service topology wherein the progress of organisations towards collaborative CRM could be classified according to one of four quadrants. The application of this topology enables organisations to be defined as IT leaders, IT enabled customer focus organisations, IT enabled operations focus organisations and IT laggards. As Figure 1 shows, an "IT leader" organisation needs to score above average on both customer and operations focus. "IT-enabled customer focussed" organisations are established on the basis of having an above average result for customer focus and a below average result for operations focus. An "IT-enabled operations" focused organisation is one that is above average for operations focus and below average focus for customer focus. Finally, "IT-laggard" organisations score below average on both customer and operations focus.

Integrating Figure 1 with Table 1 suggests that IT-laggard organisations fall within Stage 1 of CRM implementation. Organisations determined to be either IT enabled customer or operations focus are at Stage 2, while IT leaders are at the final, Stage 3, collaborative CRM.
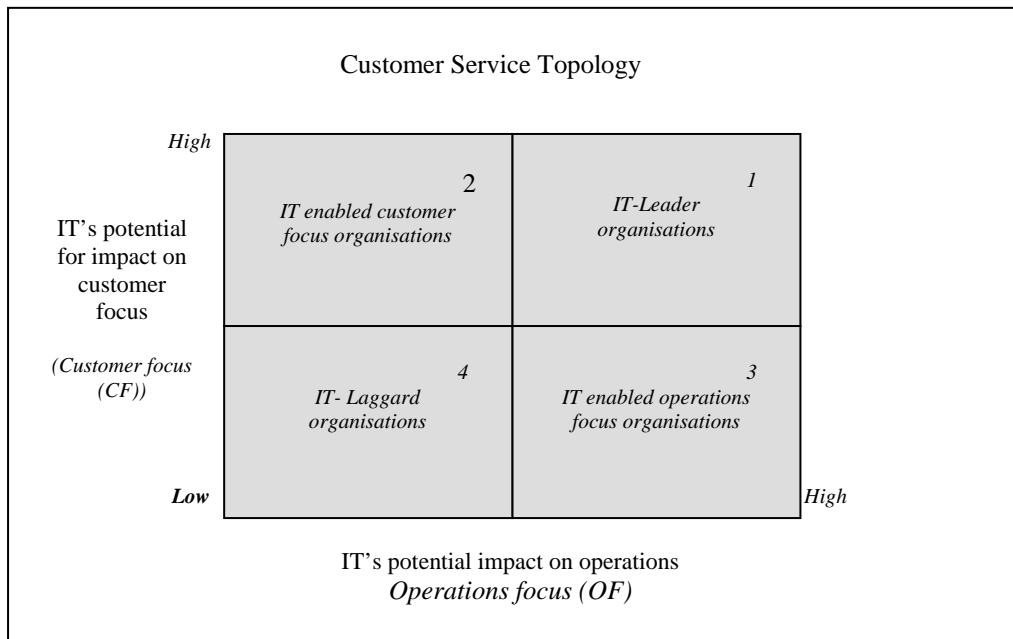

Figure 1: Customer Service Ttopology (Karimi, Somers & Gupta, 2001:130).

Karimi, Somers and Gupta (2001), also link their customer service topology with IT management practices. In so doing, they go beyond the basic operations or customer focus to identify IT management sophistication and the role of the IT leader as important measures of IT management practice. IT management sophistication is broken down into four dimensions: IT planning, IT control, IT organisation and IT integration.

Within this context, IT planning involves the long-term strategic application of IT. This implies a shift from a focus on a computing plan based on technology to the alignment of IT with the business objectives of the organisation. IT control describes the formal procedures that need to be in place so

the performance of IT can be formally defined and monitored. This procedure needs to have established guidelines as to how this should be conducted. IT organisation focuses on how IT is handled within the organisation. Rather than being a stand-alone component of the organisation it needs to be incorporated into the business units to support the business objectives. In more CRM advanced organisations a high degree of IT integration is an essential prerequisite to achieve holistic CRM.

The role of the IT leader is seen as crucial for the successful implementation of collaborative CRM. The person working in this capacity needs to be a corporate member in the organisation who has a comprehensive understanding of the business and works closely with top management. In addition, the IT leader needs to be capable of delivering IT solutions to support the organisation achieve its objectives. This implies that the role of the IT leader is not simply that of a technical manager, but that of an innovative business leader.

In their study of 213 IT leaders in the U.S. financial services industry, Karimi, Somers and Gupta (2001) found a strong direct relationship between IT management practice and level of CRM implementation. In particular, they found that

METHOD

This research is based on a quantitative approach in which a web-based questionnaire was administered to the Chief Information Officer (CIO) or an officer of an equivalent ranking in all 23 departments of one large information-intensive Australian Government agency that uses IT strategically to deliver a new level of services to its constituents. The agency, located in Canberra, the national capitol of Australia was identified with the assistance of a Federal Government officer with considerable knowledge of the overall structure of government in Australia.

Survey instrument

The research instrument was adapted from Karimi, Somers & Gupta (2001) Who drew on existing research in the development of this questionnaire. For example, the IT maturity scale was based on previous work from Benbasat, Dexter & Mantha (1980), Earl (1989) and Sabherwal & Kirs (1994). The IT leader role items came from the earlier work of Karimi, Gupta & Somers (1996) as well as that of Applegate, McFarlan & McKenney (1996) Earl (1989) Feeny, Edwards & Simpson (1992) and Sager (1998). Applegate (1996) was the source of reference for the impact of IT on operations..

In adopting this instrument it was necessary to ensure the questionnaire was appropriate in the context of the Australian public sector. In particular, items that were only relevant to for-profit organisations were removed. A new demographic section was developed that contained 14 questions aimed to enable comparative analysis of the departments of the Australian Federal Government agency being studied. . Following Karimi, Somers & Gupta (2001) the main body of the questionnaire was divided into three main aspects of CRM: IT focus on operations, IT focus on customer (client) interactions and IT management practices (IT sophistication and IT leader's role). Responses in this section were based on a five-point Likert scale where 1 indicated strong disagreement and 5 indicated strong agreement with 40 statements related to these three aspects of CRM.

Pilot

The questionnaire was subjected to two rounds of pilot review to confirm that the instrument was suitable in the context of the Australian public sector culture.

The first was conducted using a paper-based draft of the questionnaire and involved two perspectives of review. An academic perspective provided input from those with experience in conducting information systems research. The evaluation by public sector officers enabled feedback from those working within the proposed research environment. The feedback obtained from this process provided an opportunity to refine the questionnaire before its conversion into electronic format.

The second round of pilot testing was conducted using the electronic version of the questionnaire. Seven senior officers from the host Australian Federal government agency participated. The outcome from this pilot process resulted in the instrument being subjected to further minor adjustments. For example, some terminologies were changed to fit the Australian context. The pilot reviews addressed both the face validity and content validity of the questionnaire.

Administration of the main questionnaire

The questionnaire was distributed to the heads of 23 departments in the designated Australian Government agency   An introductory e-mail from the Commissioner of the host Federal Government agency was also distributed to each department head to encourage recipients to urge their Chief Information Officer or similarly-ranked IT leader to take part in the research. The e-mail provided a link to the web-based questionnaire that could be completed electronically, saved and then returned via e-mail to the researcher. At the web site, potential respondents could access an information sheet that described the objectives of the research as well as establishing its compliance with the requirements of the Human Ethics Committee at the University of Tasmania.

Responses were received over a one-month period. The benefit of using an electronic questionnaire was that responses were collected and collated without any need for translation or manual coding. As such coding errors and omissions were minimised.

RESULTS

Of the 23 surveys administered, 17 were completed and returned for a 74% response rate. This response rate is well above the level generally regarded as acceptable for survey research (Neuman 2000). The surveys were completed by seven CIOs, two functional managers, two IT managers, three IS or knowledge service managers and three IT infrastructure managers, who had served in their present position for periods ranging from one to five years.

A Profile of Participating Departments

Table 2 provides the characteristics of each of the departments of the Australian Federal Government agency, as a whole and by customer topology.   All the departments were relatively large in terms of annual budgets and number of employees. Thirteen (77%) departments had budgets greater than $100 million and only one reported an annual budget between $10-$50 million and no department reported budgets below $10 million. Similarly, IT budgets ranged from $11 million to in excess of $100 million, with 10 departments. In terms of number of employees, the majority of the departments were relatively large employing more than 2,000 employees. Only

three departments employed less than 500 employees. Funding allocations were proportionate to number of employees.

In most of the departments, the IT functional head sat one or two levels below the CEO and all departments reported they had engaged in some form of IT planning.

No. Employees	N	Annual budget	N	IT annual budget	N
>2000	9	>$100 million	13	>$100 million	4
1001-2000	2	$51-100 million	3	$11-100 million	10
500-1000	3	$10-50 million	1	$1-10 million	3
<500	3				

IT leader below CEO	N	IT planning	N
1 level below	6	1-5 years	10
2 levels below	6	6 -10 years	4
3 levels below	5	>15 years	3

Table 2: Profile of Departments (n=17)

The survey data were checked within SPSS and found to be of normal distribution with respect to skewness and Fisher kurtosis, thus allowing the use of robust parametric statistical analysis. There were no outliers.

The data were also tested for reliability. This tested the internal consistency of a set of scale items (Francis 2004), the results of which are shown in Table 3. Although the instrument used had been previously validated, it is interesting to note that in the current setting it was necessary to remove 11 items from the original 40 items to achieve a Cronbach alpha reliability measure of .70 or above as prescribed by Nunnally (1993). The resulting 29-item questionnaire achieved reliability scores for the IT focus on operations, IT focus on customer (client) interactions, IT management sophistication and IT leader's role ranging from .71 to .85. A copy of the questionnaire is available on request from the first author.

Table 3 also provides the level of agreement (standard deviation) for each item. The highest level of agreement (SD .55) relates to responses to the IT leader's role section of the questionnaire. The level of agreement for IT planning and IT organisation was slightly less (.79 and .72 respectively). The lowest level of agreement was recorded for IT integration (.86).

Construct	Mean (SD)	Cronbach's Alpha	No. of Items	
IT-Enabled Focus			Adjusted	Original
Operations	3.32 (.81)	0.73	4	4
Customer	3.63 (.83)	0.80	4	6
IT Management Practices				
IT sophistication	3.89 (.72)	0.85		
IT planning	4.07 (.62)	0.79	4	6
IT organisation	3.88 (.67)	0.72	4	4
IT control	3.87 (.74)	0.85	6	6
IT integration	3.67 (.86)	0.75	3	6
IT leader's role	4.38 (.55)	0.71	4	8
Total			29	40

Table 3: Construct Reliability (n=17)

To determine whether items of a construct correlate more highly with items within the construct than with those that measure other constructs it is useful to use discriminant analysis. To test the discriminatory properties of the items and constructs, two tests were performed. First, a correlation matrix was constructed to determine the percentage of within-construct correlations that associated higher with an item from another construct than with items within its own construct. This test revealed that only 28% of the items associated more highly with an item from another construct, thus meeting the criteria of less than 50% set by Campbell and Fiske (1959). Next, bi-variate correlations between each of the construct scales were analysed and the average variance explained was computed as shown in Table 4. These results demonstrate that all constructs were more highly correlated within their dimensions than they were with other constructs, indicating that the constructs were distinct. Further support for the distinctiveness of the constructs was provided in that the average variance explained for all constructs exceeded the .50 level recommended by Fornell and Larcker (1981).

Construct (No. Items)	Ops	Cust	IT Soph	IT Plan	IT Org	IT Cont	IT Integ	IT Leader Role
IT-Enabled Focus								
Operations (4)	.73							
Customer (4)	.272	.80						
IT Management Practices								
IT Sophistication (17)	-.196	.043	.85					
IT planning (4)	-.066	.075	.783	.79				
IT organisation (4)	-.332	-.054	.700	.421	.72			
IT control (6)	-.387	-.053	.708	.466	.779	.85		
IT Integration (3)	.189	-.064	.361	.361	.088	-.171	.75	
IT leader's role (4)	-.057	.255	.702	.444	.495	.386	.582	.71

Table 4. Inter-Correlation Matrix of Constructs

Next, each of the 17 participating Australian Federal Government departments were classified into one of the topology quadrants suggested by Karimi, Somers and Gupta (2001) based on each department's individual mean response for customer focus and operations focus. Those scoring higher than the cumulative mean on customer focus or operations focus were classified in the high category for that dimension, and vice versa. Those departments who scored higher than the cumulative mean on both dimensions were classified as IT-Leaders. Those scoring lower than the cumulative mean on both dimensions were classified as IT-Laggards.

To cross-validate the classification of each department, a hierarchical discriminant function analysis was conducted to assess prediction of membership into each of the four quadrants based on the five IT Management Practice variables. The predictor variables were IT planning, IT organization, IT control, IT integration, and IT Leader's role. Of the three functions calculated, function 1 accounted for 86.3% of the between-group variability and 16 of the 17 cases were predicted as classified by the cumulative mean method described above and used by Karimi, Somers and Gupta (2001), thus providing good support for the cumulative mean method and demonstrating the variability between quadrants of IT management practices. A loading matrix of correlations between predictor variables and discriminant functions (Table 5) suggests that the primary variable in distinguishing between quadrants is IT integration, followed closely by IT leader's role.

Variable	Function		
	1	2	3
IT Integration	.676	.722(*)	-.111
IT organisation	.022	.210	.952(*)
IT control	-.053	-.031	.811(*)
IT leader's role	.671	-.175	.716(*)
IT planning	.152	.403	.483(*)

Table 5: Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions (*Largest absolute correlation between each variable and any discriminant function)

The classifications shown in Figure 2 suggest that the customer service topology within Australian Federal government departments is mixed. Three departments were classified as IT leader organisations.. Three were classified as IT-enabled customer focus departments because of their above average focus on customers and their below average focus on operations. Seven departments fell within the IT-enabled operations focus topology. This implies they have an above average focus on operations and a below average focus on customers. The remaining four departments fell into the IT laggard category.

Customer Service Topology

High	2 *IT enabled customer focus organisations* CF = 4.58 (SD.14) OF = 3.25 (SD .43) n = 3 (18%)	1 *IT-Leader organisations* CF = 3.83 (SD .58) OF = 4.42 (SD .14) n = 3 (18%)

IT's potential for impact on customer focus

(Customer focus (CF))

	4 *IT- Laggard organisations* CF = 2.75 (SD.61) OF = 2.69 SD .94) n = 4 (24%)	3 *IT enabled operations focus organisations* CF = 2.89 (SD .32) OF = 4.00 (.46) n = 7 (41%)
Low		**High**

IT's potential impact on operations
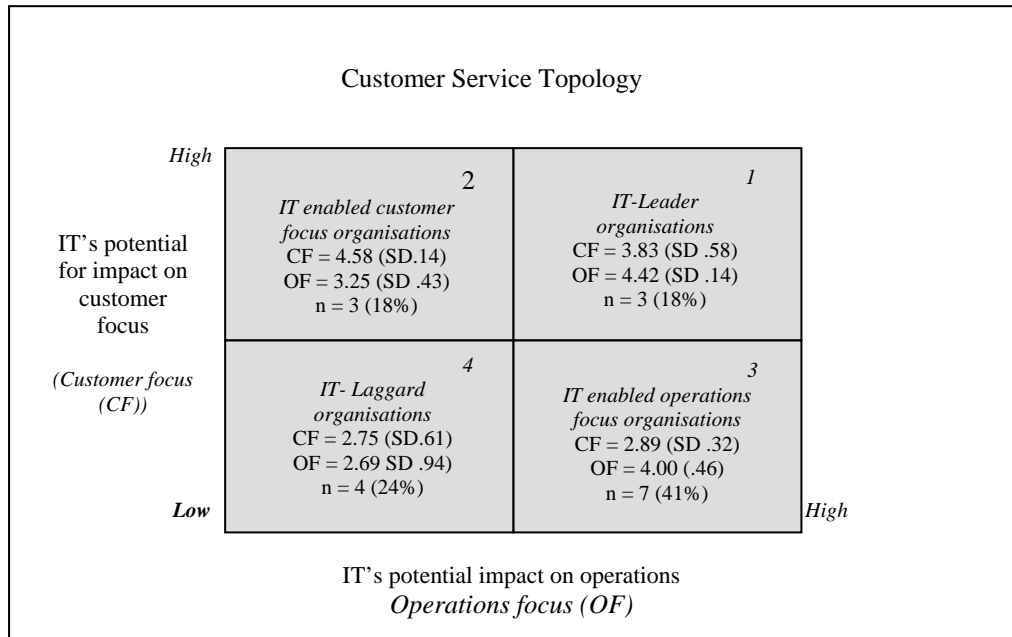*Operations focus (OF)*

Figure 2: Australian Federal Government Departments by Customer Service Topology

On average, Table 3 suggests that IT's impact was directed more toward a customer focus (3.63, SD.83) than operations (3.32, SD .81). In addition, departments were more sophisticated in IT planning (3.67, SD 1.16) and control (3.67, SD .87), closely followed by IT organisation (3.50, SD .87) and less so for IT integration (2.78, SD .19). Analysing the departmental characteristics by customer topology reveals some differences (see Table 5). For example, while all departments had substantial annual budgets, only one company (an IT Laggard) reported an annual budget of $50M or less. This same observation is true of the IT annual budget. Similarly, while the IT leader is typically one or two levels below the CEO, exceptions were reported in the smaller departments classified within the IT-enabled operation or IT-laggard topologies.

Customer Topology/Characteristic	IT Leader	IT Customer focus	IT Operations focus	IT Laggard
Annual budget				
>$100 million	3	2	6	2
$51-100 million		1	1	1
$10-50 million				1
IT annual budget				
>$100 million	2	1	1	
$11-100 million	1	2	5	2
$1-10 million			1	2

No. Employees				
>2000	3	2	4	
1001-2000			1	1
500-1000		1	1	1
<500			1	2
IT leader level below CEO				
1 level below	2	1	2	1
2 levels below	1	2	3	
3 levels below			2	3
IT planning				
1-5 years	2	1	3	4
6 -10 years	1	1	2	
>15 years		1	2	

Table 5: Department Characteristics by Customer Topology

Analysing IT management practices within customer topology quadrants (see Table 6), provided some interesting results.   For example, on average, IT-laggard organisations were uncharacteristically higher on IT organisation (4.19, SD .72) and IT control (4.32, SD .71) than the other three quadrants.   IT-enabled operations focus organisations were highest on overall sophistication (4.02, SD .43) and IT planning (4.21, SD .59), whereas the IT leader's role (4.92, SD .14) was highest in IT-enabled customer focus organisations. Surprisingly, IT-Leader organisations were not highest on any of the dimensions, as would have been expected.

Customer Topology Quadrant	IT-Leader (n=3)		IT-enabled Customer Focus (n=3)		IT-enabled Operations Focus (n=7)		IT Laggard (n=4)	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Sophistication	3.40	.77	3.99	.22	4.02	.43	3.92	.47
IT planning	3.67	1.16	4.08	.38	4.21	.59	4.13	.32
IT organisation	3.50	.87	3.92	.58	3.86	.68	4.19	.72
IT control	3.67	.87	3.94	.68	3.73	.82	4.21	.71
IT Integration	2.78	.19	4.00	.88	4.29	.30	3.17	1.04
IT leader's role	3.75	.43	4.92	.14	4.57	.54	4.13	.25

Table 6: Variability in IT Management Practices Across Customer Topology Quadrants

Following from the results of the discriminant functional analysis that suggested that IT integration and IT Leader's role were the two variables that most highly distinguished between the topology quadrants, a multiple analysis of variance (MANOVA) test was conducted to determine if any of the IT management practices varied significantly across the four quadrants.   The results of the MANOVA are summarised in Table 7.

Variable	Type III Sum of Squares	Adjusted R-Squared	Df	Mean Square	F	Sig.	Eta Squared	Observed Power (a)
IT planning	0.646	0.098	3	0.215	0.526	0.672	0.108	0.129
IT organisation	0.819	0.092	3	0.273	0.551	0.657	0.113	0.134
IT control	0.722	0.129	3	0.241	0.393	0.760	0.083	0.108
IT Integration*	6.344	0.435	3	2.115	5.101	0.015	0.541	0.815
IT leader's role*	2.571	0.416	3	0.857	4.806	0.018	0.526	0.789

Table 7. Results of MANOVA of differences in IT practices between Customer Topologies
$* p < .05$

Of the five variables tested, IT integration ($p < .05$) and IT Leader's Role ($p < .05$) were statistically different between the quadrants. While MANOVA identifies statistically significant differences, it does not identify the between-group significance. To do so, requires the application of post hoc testing. As Figure 2 shows, the groupings within the customer service topologies are unequal in size. Applying the Levene statistic, two of the six items failed to meet the criteria of homogeneity of variance. IT integration and IT planning variables were determined to be significantly different at the probability level of $p<.05$. IT integration at df 3, p= .049 and IT planning at df 3, p=.036. For these variables, to analyse multiple pair-wise comparisons the Dunnett T3 post hoc test was used. According to Garson (2002), this approach is appropriate in a situation where the assumption of homogeneity of variance and unequal sample sizes have not been met.

The Dunnett T3 post hoc analysis, showed that the mean for IT integration was significantly different in IT-enabled operations focus organisations and IT leader organisations (p=.000). For the IT leader's role variable a significant mean difference was found between IT-enabled customer focus organisations and IT-laggard organisations (p=.017).

DISCUSSION

The results show that at the time of data collection only limited progress had been made towards achieving collaborative CRM in one large agency of the Australian Federal Government departments. Only three of the 17 participant departments were classified as IT-Leader organisations.. An examination of the demographic results presented in Table 3, provides some indication of the profile that might set these departments apart from the remainder of participant departments. It would appear that size may be a factor in promoting the uptake of collaborative Stage 3 CRM. However, it would appear that some progress is being made by small departments toward CRM implementation maturity since 10 departments have moved to Stage 2 CRM through either an IT-enabled customer focus or IT-enabled operations focus and only four appear to be IT-Laggards. A comparison of the percentage of departments in each of the four customer topologies showed mixed results compared to that reported by Karimi, et al. (2001). A much smaller percentage of departments in the current research (18%) had progressed to the IT-Leader category contrasted with 38% of those in the Karimi, et al. (2001) sample of U.S. financial firms, while a greater percentage (41% vs. 27%) were classified as IT-enabled operations focus organisations. The percentages of IT-enabled customer focus (18% vs. 15%) and IT-Laggard departments (23% vs. 20%) were comparable. These differences may be due to the more recent uptake of CRM in public

sector organisations relative to the longer-term uptake in the private sector, but these differences in findings might warrant further qualitative investigation.

The literature suggests that Stage 3 departments have undertaken the required organisational transformation and acquired new applications to support the change in business approach. While the organisations have the resources (both human and financial) to progress to this stage, it would appear they have also been prepared to face the high risks and costs involved to gain the benefits of increased revenues and profits. At this stage of CRM implementation organisations are positioned to engage in participatory interaction with their customers unlike those in Stage 1 or Stage 2 where interaction is still either on a managerial or a consultative basis.

Stage 3 departments can potentially act as role models to act as motivators in encouraging the departments not so well placed in relation to CRM implementation, to make the necessary organisational transformation to move toward a higher level of CRM implementation. The benefit of having established role models in relation to CRM implementation implies best practices are in place that can be adopted by less CRM advanced departments.

The results of this research have established that the bulk of departments within one large Australian Federal Government agency departments (implying IT enabled customer focus and IT enabled operations focus organisations) are typically focussed on technical accuracy with the aim of gaining benefits in cost savings from a consolidated infrastructure. Because these departments tend to still have individual applications based on a large amount of data from disparate systems, they are not yet in a position to attempt the enterprise transformation to move to Stage 3 collaborative CRM. At Stage 2 CRM implementation the costs are generally medium to high, while the risks are regarded as medium. While these departments do have a uni-linear information flow, interaction with clients is more consultative that participatory. Potentially where this situation exists it can imply a barrier to collaborative CRM due to a silo effect where individual departments are unwilling to share information. Often this situation is maintained as department managers actively work to keep their power and maintain their status quo.

Turning to the customer service topology, those departments defined as IT laggards focus on operations involving localised departments. This implies that multiple individual applications are used with data limited in scope and volume. Based on the research presented in this paper, the departments defined as being IT-laggards tend to be smaller in size with relatively lower overall and IT budgets. It may well be that limited resources (both human and capital) have precluded any move to a higher stage of CRM implementation especially in view of the high risks and costs involved.

IT management sophistication was tested as a whole and from four perspectives: IT planning, IT organisation, IT control and IT integration. MANOVA tests failed to detect a significant difference in IT Sophistication at both the overall level and the dimension level. The MANOVA test found a statistically significant difference in IT integration between two of the four topology groups. The post hoc pair wide comparison revealed this to be between IT enabled operations focus and IT leader organisations. IT enabled operations focus departments are typically large organisations with a heavy focus on administration and the financial aspects of government. On this basis, their highest level of IT integration supports the view that substantial operationally focussed practices are embedded in these departments.

The MANOVA test also found a statistically significant difference in IT Leader's Role between IT-enabled customer focus organisations and IT Laggards. From the literature, the role of the IT leader was identified as crucial for the successful implementation of collaborative CRM. Accordingly this created an expectation that the results would support this in the classification of IT leader within the topologies.

A potential explanation for the difference between IT enabled customer focus organisations and IT laggard organisations can be due to the size of these departments. IT enabled customer focus organisations are mostly large organisations that have high personnel content whether it be dealing with people in society or with their own employees. In contrast, IT laggard departments are smaller in size and operations and if IT is used it is often only at a rudimentary level. As such, it is reasonable to accept that the role of the IT leader would be considerably different between these two topologies. The results of this research showed that generally IT laggard organisations reported IT leaders 3 levels below the CEO. This supports that the role of the IT leader in these organisations is more involved with the management of IT rather than providing innovative business solutions based on IT.

CONCLUSIONS

This research is exploratory and has provided some useful results. An encouraging outcome was that despite the recent uptake of CRM in the public sector, some of the Australian Federal Government departments appeared to be IT-Leaders at the collaborative stage of CRM implementation. A further positive finding was that the bulk of the remaining departments were IT-enabled customer or operations focussed organisations with only a minority being identified as IT-Laggards.

While some statistically significant differences were determined on the basis of the overall data and the customer service topology data, these results also highlighted a major limitation in this research. That is, the problem associated with small group numbers and equality of variance. However, since this research was based on a limited population of a large government agency, at this level of government the situation was unavoidable.

Potentially, the research presented in this paper could form the basis for future work to determine the status of CRM implementation across Federal Government agencies to increase the research sample.

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