

CUSTOMER RELATIONSHIP MANAGEMENT AND INFORMATION TECHNOLOGY

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ABSTRACT

Undoubtedly, it can be said that customers are the most important asset in the most organizations. Since customers have a direct relationship to the actions of an organization, therefore they are valuable source of opportunities and threats operational questions related to the industry. Today, to grow and survive in competitive economy, companies and organizations should pay attention to customer orientation and increase their relationship with the buyers of goods more than ever. Theoretical models of customer relationship management include three dimensions of thought, social and technological information. This paper is an introduction of the principles and concepts of management, communication with customers and benefits of applying this and examined trends in customer relationship, challenges facing of CRM systems, the implementation model and also the applicable solutions of implementation process of the system in organization.

Keywords: Customer Relationship Management, Strategy, Information Technology, Marketing

1.0 INTRODUCTION

After the Industrial revolution, the world has undergone fundamental change in all aspects. Trade or business in various human societies has not been exempt from this general rule and noticeably was in the changes cycle. Managers of business and production of organization in order to stay ahead and success in competitive market have created various strategies and techniques. Business and marketing was converted from the simple and traditional to the highly professional activity, requiring extensive knowledge in the areas of social, political, cultural, economic and information technology (Abbasi and Torkamani, 2010).

Today, marketing is not only development, supply and sales, but the continuous development, services after sales with a long-term relationship with the customer is also added. Since loyal customers are a key component of successful businesses and organizations, building customer loyalty is a concept that has been taken more attention in today's business (Ellinger & et al, 2000).

According to these issues, customer relationship management in organizations is a business strategy (Abbasi and Torkamani, 2010). This paper, after reviewing the literature related to customer relationship management, its principles and concepts, aims to examine the effect of the CRM strategy selection in the organization and providing theoretical model of its implementation to establish the proper implementation of this system and gain competitive advantage in the world.

1.1 PRINCIPLES AND CONCEPTS OF CUSTOMER RELATIONSHIP MANAGEMENT

CRM with its current meaning was emerged from 1990s as a business strategy and developed to select and manage the most valuable customer relationships. CRM requires a customer-oriented philosophy and culture to support effective marketing process, sales and after-sales service organization.

Customer relationship management is comprised of 3 parts: customer, relationship, management (Al-Badawi and Enayat Tabar, 2006). Concept of customer is the ultimate consumer who has a supporting role in valuable relationships. Concept of relationship is to build loyal and profitable customer relationships through the learning relationships. Management is creativity and guiding of a customer-oriented business processes and placing the customer at the center of procedures and experiences of the organization.

Experts and theorists have different definitions for customer relationship management that can be classified in four general groups containing strategies, technologies, processes and information systems (Thompson, 2004).

Some of the definitions for customer relationship management from the view of different theorists are as follows:

CRM is a part of the organization strategy for identifying and keeping customers satisfied and converting them to a repeat customer. In addition, in line with the customer relationship management, it helps the company in order to maximize the value of every customer (Turban et al., 2003).

CRM is a set of methodologies, processes, software and systems that helps institutions and companies in creation effective and organized management of customer relationship (Burnett, 2001). 3- Customer relationship management as a process, consists of monitoring clients (such as appropriate data collection of them), management, and evaluation data and finally, creating real advantage from information extracted in dealing with them (Hampe and Swatman, 2002).

Customer relationship management is a comprehensive business and marketing strategy that integrates process technology and all business activities around the customer (Feinberg and Romano, 2003).

From the above definitions, it can be concluded that CRM strategy is a business to optimize profitability, revenue and customer satisfaction by the organizing services based on customer needs, and also improving customer satisfaction is designed accordance with the principles and implementation process customer oriented.

CRM objectives can also be expressed as follows:

a. Increasing revenue:

- i. Identifying new opportunities
- ii. Reducing missed opportunities
- iii. Reducing customer defection

b. Building customer loyalty:

- i. Improving customer service
- ii. Enhancing appearance of organization

c. Reducing costs:

- i. Storing of organization information
- ii. Reinventing marketing (Sarafrazi and Memarzadeh, 2007).

1.2 Types of CRM Systems:

These systems can be divided into three general categories:

- a. **Operational CRM**
In this method, the entire process of customer communication, from marketing and sales to after-sales service and receiving feedback from the customer should be vested in a person so that sellers and service engineers can be able to access the history of their customers (Johan and Storm, 2002).
- b. **Analytical CRM**
In the analytical CRM, a set of tools and techniques are used that causes the data obtained from operational CRM from data collection and processing until customer referrals can be reached to concerned officials in minimum possible time (Paul and Jung, 2001).
- c. **Collaborative CRM**
Collaborative CRM is a customer relationship management approach in which multiple units like a sales, marketing and technical support share any information obtained from customer interactions. Purpose of participating in a CRM is to improve quality and levels of customer service and result in increased customer satisfaction and customer loyalty as the ultimate goal in a customer relationship management system (Zia khosoosi, 2011).

1.3 CRM implementation process

Customer relationship management has processes for achieving its goals which is considered from different perspectives. One of these theories is CRM life cycle model of Kalakota (2001) which consists of three phases of attraction, promoting and maintenance, and every phase supports knowledge and comprehending of relationship between the firm and its customer. This theory states that every phase has different effect on communication with customers, therefore strategy used by organization from each phase to another phase would be varied which is shown in the table below (Sarafrazi and Memarzadeh, 2007).

Table (1) CRM processes and organizational attention and strategies associated with them

Processes	Actions	Focus Center of Organization	Strategies
Attraction	Promoting the goods and services leadership	Distinguish	Innovation
Promotion	Improving the profitability of existing customers	Separation	Reducing costs - service to customer
Maintaining	Customer retention for their life (focus on providing services based on customer desire)	Adaptation	According to customer – supplying new product

Source: Ali Feizbakhsh Tavana et al, (2013)

Another theory about the processes of the CRM is Swift's model. According to this model, the process cycle includes the following steps:

- a. Knowledge discovery:** Analysis of customer characteristics and investment strategies which is done by process of identifying, classification and predicting customer of organization.

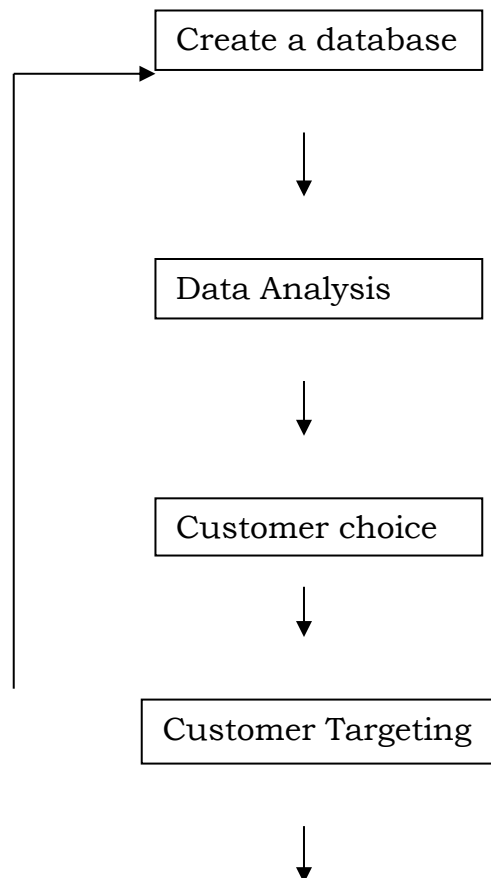
- b. Interaction with customers:** Implementation and customer relationship management through relevant information at the right time and providing products using a range of interaction channels.
- c. Market planning:** Definition of distribution way and the products that be offered to specific customers and developing strategic communications plans and programs.
- d. Analysis of refinement:** With the purpose of attraction and analysis of customer data through the communication that organizations has acquired by interactive paths (Swift, 2002).

Swift defined CRM as a process of continuous learning in which information about each customer would establish a relationship with them. Customer information is not only sufficient, but also the needs of each of them should be collected and analyzed, and appropriate response should be given.

1.4 Steps of Serving Clients in Customer Relationship Management

In the first step of serving, database is prepared based on data and information of customers. Then information collected in the database is analyzed based on different techniques. The target customers are selected based on profitability criteria for company. In the next step, appropriate marketing mixture is designed for target customers. Then by using information obtained from previous stages, communication with customers is started and finally, after the implementation of relationship marketing, the results obtained is monitored and evaluated.

Steps of serving clients in customer relationship management are shown in Figure 1.



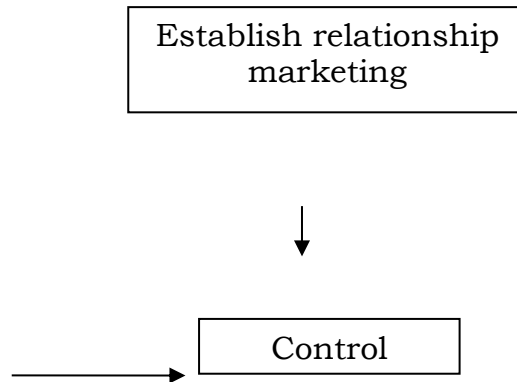
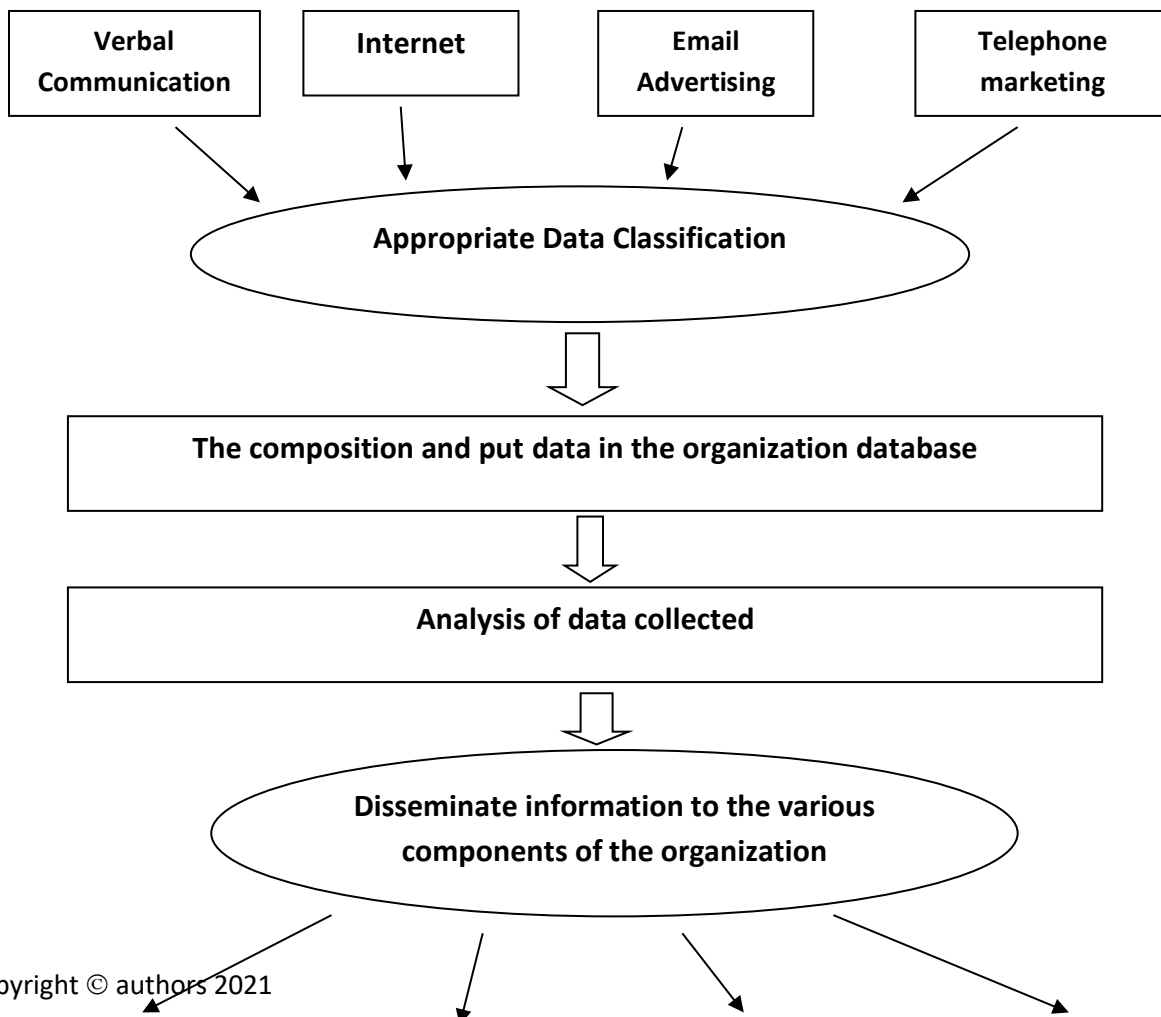


Figure (1): Customer Relationship Management implementation process.

Source: Reza Vaghari et al, (2013)

The data structure in CRM can be shown by following diagram:



Support

Selling

Marketing

Management

Source: Alireza Tohid et al, (2013)

1.5 Critical success factors in CRM implementation strategy

Implementing a successful CRM strategy in strategic management of internal market of a company that has the above benefits may depend on the following key factors:

- a. **Training company employees:** Company employees should be trained in the field of interaction and connection with the customers to be able to communicate with customers effectively and also have the ability to use new technologies.
- b. **Reviewing processes and designing new processes:** firms without well-designed and logical processes cannot achieve their goals. Companies should define their business needs and goals, and related CRM processes should be improved and expanded to achieve these needs. Business Process Re-engineering or BPR is one of the effective tools in this section (Swift, 2002).
- c. **Applying new technologies:** Using CRM requires changes in the infrastructure of the organization and deployment of new technologies like new business rules, databases, information technology and so on. These changes will lead to an effective and useful development.

2.0 Functions of Information Technology (IT) in Customer Relationship Management (CRM)

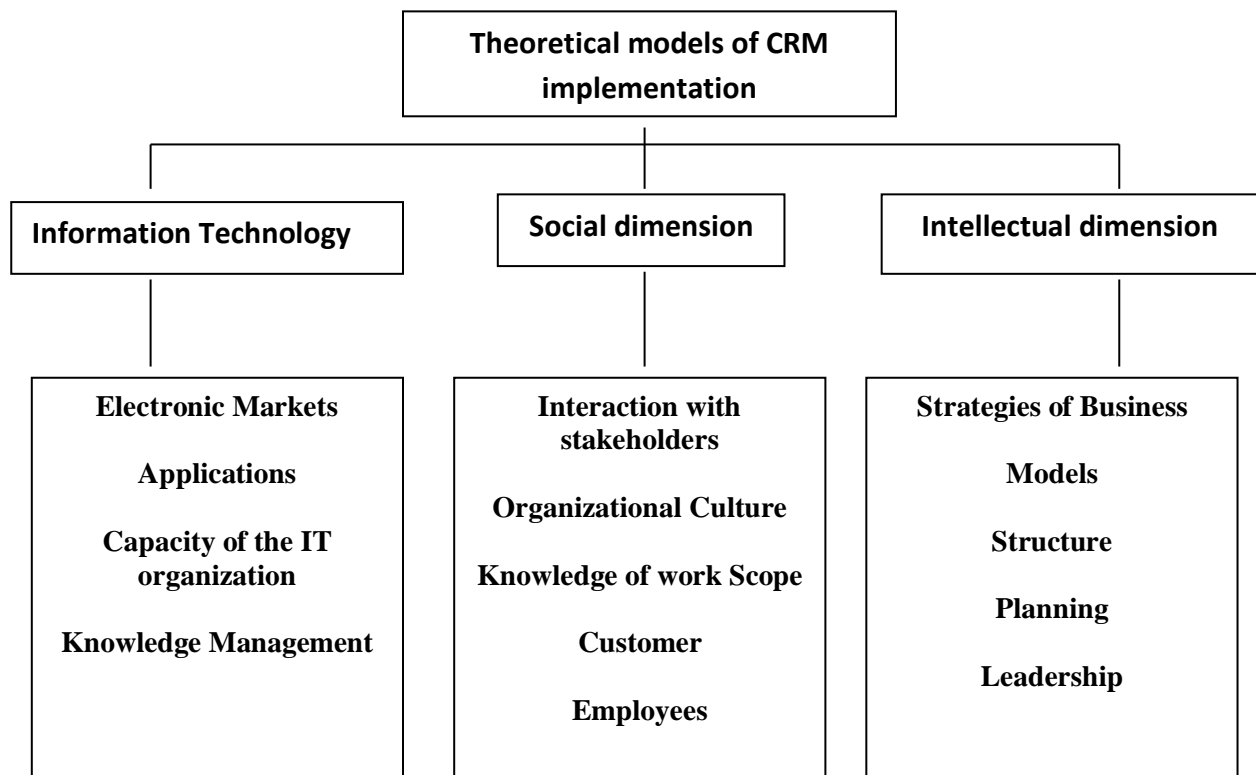
1. E-Commerce
2. Provides complete product information
3. Provides an easy ordering and billing process
4. Provides service after sales
5. Integrating information into one's website
6. Personalizing the web interface
7. It plays a vital role in enabling companies through more precise targeting of market segments and micro segment within
8. Assists in managing the data required to understand customers so that appropriate CRM technologies can be adapted
9. IT plays a great role in Customer Loyalty.

2.1 Functions of Customer Relationship Management (CRM) on Organizations

1. It adds customer loyalty to business bottom line
2. Allows customers to get current information at anytime from any service
3. Helps in creating appropriate strategic vision for the future

2.2 Theoretical Model of CRM Implementation

Customer relationship management in an organization is as an innovation that its realization in service organizations is a priority. Nowadays, organizations have realized the fact that are not able to produce like before and cannot incline consumer to their products. In the evolution path, attention to the needs and interests of actual and potential customers is essential for success. Improvements in potential of customer relationship management and present uncertainty about its implementation in organizations cause a new view of decision determinants of firm for using CRM strategy. According to a literature review of the concepts and principles of customer relationship management, it can be concluded that customer, staff, leadership, organizational culture, strategy and structure are the main factors needed for CRM implementation. Therefore, following theoretical model containing three aspects (intellectual, social and technological information) can be explained and designed.



Source: Saeed Fili et al, 2013

3.0 Research methodology

This article investigates various facets of the evolution of CRM using a pilot study conducted in Tunisia. This article uses an empirical study using a quantitative research methodology where the instrument is a survey questionnaire.

The instrument, which is translated into French to ease its usability for the Tunisian subjects, contains 121 questions divided into 6 sections organized in terms of the CRM process approach:

1. CRM input section
2. CRM output section
3. CRM objectives section
4. CRM control mechanism section
5. CRM process section
6. CRM resource section

3.1 Research Design

This section presents the research design adopted in this study. It includes our experimental design, our sampling process, and our hypotheses to be tested. Details of the data analysis based on our research objectives are discussed later in the paper. Sampling is needed here to select a part of the population of organizations that are CRM users, for the purpose of drawing general conclusion about the population. There are often three main interrelated concerns: sampling cost, information accuracy, and sample size. Sampling cost is primarily concerned with the cost of the sample size and the method of data collection. Information accuracy depends on sample representativeness, administrative errors, and subject errors and carelessness. The sample size is related to the availability of historical data about similar surveys, the confidence interval prescribed by survey owners, and the tolerated margin of error adopted. At this point of the pilot study, we received 19 cases that we included in this study. According to our fixed tolerated error received from selected experts in the field of Marketing and IT, a sample size of 15 cases will be sufficient. Of course, more is better, but we do not have that luxury to have more cases because the population of CRM adopters in Tunisia is still very small. The difference between the pilot study and a formal one may be expressed in the error term, assuming a 95% confidence factor, as follows: $(6 = [1.96/e]^2$ which gives $e = .80$; or $15 = [1.96/e]^2$ which gives $e = .50$). Assume that every subject participating in the survey requires a very high cost to fill out and return the questionnaire, and then the cost for using 15 cases will be about double the cost of using 6 cases. You can see that there should be a tradeoff between accepting an error of .80 when using a smaller sample of 6 cases and achieving a lower error of .50 by incurring double cost of using a larger sample of 15 cases.

As you can see, it is only a matter of how much error our owners accept to tolerate. If a higher error of .80 is tolerated by owners then the pilot study will be sufficient to study the effects of CRM features on CRM output in Tunisia. In this case, the higher cost of collecting more data to allow for a smaller error of .50 may not be necessary. It is important to note that even a sample size of 15 is statistically acceptable, and as explained above, a small number like this one may affect the data analysis later if normality is not present in the data set due its small size. Nonparametric statistics will be used in this case. This study is concerned with the evolution of the CRM in Tunisia. CRM is investigated using an empirical study using a quantitative methodology. Even though our instrument is too long, we are almost done collecting the data. As soon as we get back all survey data, we will enter the data and proceed to data analysis. We intend to test more than a dozen of hypotheses.

3.2 Data Analysis

Data analysis is the process of gathering, modeling, and transforming data in ways that generate decisional information that reveals conclusions for the support of the marketing decision making system in place. Data analysis employs many approaches adopting diverse techniques that are used by investigators in business, science, psychology, and so on. Data analysis is however preceded by several important phases that we present below. The validation step is concerned with the cleaning of erroneous entries that have to be inspected and corrected before processing the data. There may be missing data or incomplete data that has to be validated. Of course, any subjective decision on how to

validate the data should be avoided in order to maintain the quality of the data. While data is being validated one has to make sure that original data is kept in a safe place to be available for possible re-assertion and verification. On the other hand, internal consistency is concerned with the estimation of reliability by grouping questions in a questionnaire that measures the same concept.

One may for example, include two sets of three questions that measure the same concept and then correlate, often in a Spearman way, the two sets of responses, and then determine whether or not the instrument is reliably measuring that concept. Most often, Cronbach's Alpha is adopted in computing correlation values among the questions on the instruments. Cronbach's alpha, however on its own, will split all the questions on the instrument possible ways and computes correlation values for them all. The statistical package in use will generate one number, between 0 and 1, for Cronbach's alpha. As for any correlation interpretation, the closer the Cronbach's alpha value to one, the higher the reliability estimate of the instrument. If we compare an internal consistency test, using Cronbach's alpha, to a reliability test, we will find that the Cronbach's alpha method is considerably less conservative. From a management point of view and also based on costs, test/retest involves two administrations of the measurement instrument, whereas the internal consistency method involves only one administration of the same instrument. As in most of the literature, „validity“ is defined as the strength of a study's conclusions, inferences or propositions. Cook and Campbell (1979) defines validity as the best available approximation to the truth or falsity of a given inference, proposition or conclusion. The literature reports four types of validity tests: conclusion validity, internal validity, construct validity, external validity.

1. Conclusion validity is concerned with checking the relationship between the program and the observed outcome. For example, is there any connection between CRM applicability to the adopter and CRM success?
2. Internal Validity is concerned with checking whether any relationship between the program and any desired outcome, nothing but a causal relationship? Have CRM best practices contributed in enhancing CRM performance.
3. Construct validity is concerned with checking whether or not there is a relationship between how any concepts in this study and to the actual causal relationship being tested? For example, can any increase in IT spending be behind the increase in CRM performance?
4. External validity is concerned with the reader or investigator's ability to realize the results of the study to other settings. Does any concept we have statically proven for operational CRM also apply in analytical CRM? In our study, we simply intend to obtain the Cronbach's alpha value to assure the internal consistency of data. We obtained a value of Cronbach alpha of .987. A value close to 1 shows that our data does not suffer from any internal inconsistencies.

3.3 Data exploration

While we cannot report all the SPSS Explore task here, we found that there is really not sufficient variability to produce any exploratory power that helps us better understand the data. At this point, we cannot advance the data analysis in a faster way, due to the lack of exploratory power of data, but we have to test for normality to have an idea about the things we can do and the things we cannot. For example, if we find out that our data is not normally distributed then we have to start thinking about non-parametric statistics.

3.4 Normality tests and opting for nonparametric analysis

Normality tests are concerned with determining whether or not a data set is well-modeled by a normal distribution. In this case, this represents how likely any random variable in the data set is to be normally distributed. The normality test is mainly needed for model selection, and can be interpreted several ways, depending on how probabilities are interpreted within the context of the data. Most often, as in this article, we encounter two uses of normally distributed

data set (i.e., its variables are), in descriptive statistics terms, frequentist statistics hypothesis testing terms, or in Bayesian statistics. In the first use, we measure a goodness of fit of a normal model to the data; i.e., if such fit is not so good then the data is not well modeled by a normal distribution and the normality of the data set is rejected. In the second use, we test the data against the null hypothesis that it is normally distributed. In Bayesian statistics, the test of normality should be understood as we are computing the likelihood that the data is generated from a normal distribution. We used SPSS to test the normality of the data set by testing for the normality of the variables making the data set. The output of the normality test is not shown in this article but will be provided upon request. We are here reporting only the significance probability values which are all greater than .005, for a 95% significance or .01 for a 90% significance. The arrays containing the significance probability values are not included here but may be provided upon request. At this point, we know that we do not have normality in our data set. This means that we cannot use any of the mean statistics that requires normality among other conditions. The only statistical analysis we can perform is non-parametric statistics. Nonparametric statistics is a branch of statistics dealing with variables without making assumptions about the form or the parameters of their distribution.

Parametric statistics uses the joint distribution of the observations where several unknown constants called parameters are in play. While unknowns in the model are the parameters, the functional form of the joint distribution is assumed to be known. We compute some quantities of interest that are called statistics. The aim of parametric statistics to use observations to draw inference about the unobserved parameters, often models based on means of variables. On the other hand, a nonparametric model does not use any assumptions about the functional form of the joint distribution. The only assumption we have is that observations are independent and identically distributed. There are no parameters in a nonparametric model.

3.5 Testing our process-based approach

Our study proposes two sets of contributions: 1) Testing whether or not CRM may be process-based; and 2) Testing selected hypotheses defining useful relationships among the studied CRM variables.

3.5.1 Testing the process-based CRM

A process approach will allow owners to manage the effectiveness of CRM requirements adopted by the organization. As shown in Figure 1, a process has objectives, inputs, outputs, a transformation process, and a control mechanism. This latter is needed to evaluate the gaps between the process performance criteria and its outputs. The transformation mechanism of each process is defined by marketing management. Assuming that there is nothing wrong with the process transformation mechanism then the gaps may be reduced by feasibly adjusting the inputs of the process. Optionally, a process may also display the resources used in transforming inputs into outputs. The control mechanism can only work well if two conditions are satisfied: simple metrics are in place; and precise measurements are available. It needs to assess the process outputs and evaluate the process objective based on its performance criteria and the outputs produced by the process. The control mechanism will make a decision on how to feasibly adjust the inputs in order to produce outputs that satisfy the performance criteria and achieve the desired level set for the process" objective. In order to test the process-based approach for the CRM concept, we have to test at least 7 hypotheses, represented by arrows in Figure 1, and defining effects between Objectives and Control mechanism; Control mechanism and Transformation mechanism; Control mechanism and Inputs; Inputs and Transformation mechanism; Transformation mechanism and Outputs; Outputs and Control mechanism; and Resources and Transformation mechanism. The questionnaire was designed intentionally to align with the process-based architecture of the CRM process. The same arrows shown on Figure 1 may be found also in the process-based CRM architecture shown in Figure 2. We also have placed hypotheses on the arrows to show the hypothesis testing activity that is to be conducted. The process-based approach hypotheses are:

- a. H1: CRM objectives tend to affect CRM maintenance.
- b. H2: CRM inputs tend to affect CRM process.
- c. H3: CRM maintenance tends to affect CRM process.
- d. H4: CRM maintenance tends to affect CRM outputs.
- e. H5: CRM inputs tend to affect CRM process.
- f. H6: CRM process tends to affect CRM outputs.
- g. H7: CRM resources tend to affect CRM process.

While there are many ways to test our hypotheses, bear in mind that our main objective is only to find significant correlations between the variables used to build the tested hypotheses.

3.5.2 Correlation types

Correlation is a measure of association between two variables. The variables are not designated as dependent or independent. The two most popular correlation coefficients are: Spearman's correlation coefficient rho and Pearson's product-moment correlation coefficient. However, because we have scale data we then have to calculate our correlation coefficients using Spearman's technique. The Pearson's technique should be used when we have interval or ratio-type data. All those correlations therefore have to be performed with Spearman rank correlations because we are dealing with scale variables without that are not normally distributed as shown earlier. The following is a brief comparison between the Spearman rank correlations we are using and the Pearson correlations: Spearman rank correlations:

Advantages: Less sensitive to bias due to outliers" effects -Does not require assumption of normality, although requires assumptions about symmetry of a Gaussian-like distribution

Disadvantages: Calculations become tedious in spreadsheet -Ties are important and must be factored in to computation Pearson correlations: • Advantages: – Straightforward – Easy to compute • Disadvantages – Assumes normality in both profiles of data – Sensitive to outliers That is, in order to test the H1-H7 hypotheses, we need to estimate the correlations between the following pairs of variables. The correlation table, not shown here due to space reasons, produces the following correlations:

- a. H1: Assert correlation between CRM objectives and CRM maintenance. Correlation = .593 Significance Probability = .004
- b. H2: Assert correlation between CRM inputs and CRM process: Correlation = .529 Significance Probability = .010
- c. H3: Assert correlation between CRM maintenance and CRM process: Correlation = .489 Significance Probability = .017
- d. H4: Assert correlation between CRM maintenance and CRM output: Correlation = .561 Significance Probability = .006
- e. H5: Assert correlation between CRM input and CRM process: Correlation = .529 Significance Probability = .010
- f. H6: Assert correlation between CRM process and CRM output: Correlation = .752 Significance Probability = .000

- g. H7: Assert correlation between CRM resources and CRM process: Correlation = .506 Significance Probability = .014

After examining the above correlations, you may see that all correlations are significant.

We therefore accept all the hypotheses with the corresponding probabilities of statistical significance. We then conclude that CRM may be presented as process-based approach. This conclusion will be crucial for future studies including developing international standards for the CRM concepts, as it is often a requirement that the standard be designed using a process-based approach (for example, ISO 9000/9002, ISO 27001/27002, and so on). After examining the Spearman correlation table, not provided here, all the process-based hypotheses have been accepted at a statistical significance level of .01, except for H3 and H7, they were accepted at a statistical level of .05.

3.5.3 Testing selected CRM hypotheses

This is only a pilot study where we intend to prepare a more detailed and methodical study of what will be retained as important aspects of CRM that deserve a more thorough study. Given the structure of the experimental design in this study we thought that the following hypotheses deserve a more comprehensive study:

- a. G1: CRM change management has positive effects on CRM output.
- b. G2: Probability of success has positive effects on CRM output.
- c. G3: CRM applicability has positive effects on CRM output.
- d. G4: CRM best practices have positive effects on CRM output.
- e. G5: CRM best practices have positive effects on operational CRM.
- f. G6: CRM best practices have positive effects on analytical CRM.
- g. G7: CRM best practices have positive effects on collaborative CRM.
- h. G8: Operational CRM has positive effects on CRM output.
- i. G9: Analytical CRM has positive effects on CRM output.
- j. G10: Collaborative CRM has positive effects on CRM output.
- k. G11: CRM service process has positive effects on CRM output.
- l. Q12: CRM maintenance has positive effects on CRM output.
- m. G13: CRM objectives have positive effects on CRM output.

As earlier in studying the CRM process approach, we first perform a correlation analysis. Correlations should be produced for all pairs of variables constituting each of the hypotheses above. If the significance probability is less than or equal to .005 then the corresponding hypothesis is accepted. Our SPSS computations produced the following results:

- a. G1: CRM change management has positive effects on CRM output. Correlation = .718 Significance probability = .000
- b. G2: Probability of success has positive effects on CRM output. Correlation = .770 Significance probability = .000
- c. G3: CRM applicability has positive effects on CRM output. Correlation = .509 Significance probability = .013
- d. G4: CRM best practices have positive effects on CRM output. Correlation = .729 Significance probability = .000
- e. G5: CRM best practices have positive effects on operational CRM. Correlation = .643 Significance probability = .001
- f. G6: CRM best practices have positive effects on analytical CRM. Correlation = .599 Significance probability = .003

- g. G7: CRM best practices have positive effects on collaborative CRM. Correlation = .755 Significance probability = .000
- h. G8: Operational CRM has positive effects on CRM output. Correlation = .675 Significance probability = .001
- i. G9: Analytical CRM has positive effects on CRM output. Correlation = .620 Significance probability = .002
- j. G10: Collaborative CRM has positive effects on CRM output. Correlation = .508 Significance probability = .003

The rest of the hypotheses G11, G12, and G13 are the same as hypotheses H7, H1, and H4 respectively. They have been tested earlier with the rest of the process-based approach hypotheses. Given the correlation information above, all the hypotheses have been accepted at a significance level of .01, except for G3, the statistical significance level was .05. The rest of the hypotheses G11, G12, and G13 are the same hypotheses H7, H1, and H4 respectively. They have been tested earlier with the rest of the process-based approach hypotheses.

4.0 Regression Analysis

At this point we have accepted all the hypotheses we defined. We now know that there are several important relationships between our CRM output and several independent variables of interest. Insights will be discussed in the managerial implications" section later in this article. Linear regression is used to examine the relationship between multiple independent variables and one or more response (dependent) variables. The regression statistics is useful to predict the response variable when relevant independent variables are known.

We intend to process the following linear regression:

$$Y = \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \alpha_9 X_9 + \alpha_{10} X_{10} + \alpha_0$$

Where:

X₁=CRM Maintenance

X₂=Change Management

X₃=CRM Applicability

X₄=CRM Best Practices

X₅=Analytical CRM

X₆=Operational CRM

X₇=Collaborative CRM

X₈=CRM Reasons

X₉=CRM Defiance

X₁₀=CRM Objectives

α_i = Coefficient or slope of

X_i, i=1,10 α_0 = error term

As you may see in the next tables 1 through 6, none of the independent variables is significantly related to CRM output (CRM performance); that is, those variables have no contributions in predicting CRM performance. We however used the method of stepwise regression that is designed to select the best variables to add in a regression line. This stepwise regression model has selected only the independent variable „CRM input“ that has been selected to have significant relationship with CRM. The stepwise regression method processed 10 candidate variables that can potentially be employed to build a regression model. This method retained only one independent variable, called „CRM input“ and excluded the rest of the 9 independent methods. The following variables have been excluded from the linear regression model: X1=CRM Maintenance; X2=Change Management; X3=CRM Applicability; X4=CRM Best Practices; X5=Analytical CRM; X6=Operational CRM; X7=Collaborative CRM; X8=CRM Reasons; and X9=CRM Defiance. This section then analyzed our data for the purpose of producing some useful conclusions. Our data analysis proceeded by exploring the data set but the data has not shown sufficient variability. This lack of variability limited our ability to better understand the data which is needed to generate proposals of ideas that are to be tested throughout our data analysis. We then tested the data set for normality and obtained that normality is not present. The lack of normality obliged us to switch from an initial setting to perform parametric statistics to complete our study to non-parametric statistics. The Spearman correlation method was adopted to study all variables involved in defined our hypotheses. We had then two groups of hypotheses: a first set of hypotheses was needed to assert the process-based approach to model the CRM concept; and a second set of hypotheses defined to test some important relationships between certain independent variables and CRM performance. All hypotheses of the first group have been accepted which asserts the process-based approach to model the CRM concept. All hypotheses of the second group were accepted which tell us that we cannot study CRM output without studying all those independent variables. Finally, after detecting the presence of those relationships between CRM output and many other variables of interest, it is only logical to advance further and build the linear regression model hoping to be able to build a predictive power for the purpose of classifying CRM output based on the knowledge of some selected independent variables. Results showed that all attempts to add the candidate variables to predicting regression line failed except for the „CRM input“ variable. The regression we optionally produced (normality automatically corrected by the SPSS procedure applied) has not shown any significant results for all the variables included. The only variable that showed significant results is the CRM input variable. Because all the variables entered are excluded by the stepwise regression we applied, except for the input variable, we thought that we might need to develop a simple regression model with one independent variable, the CRM input. In fact, the production of the regression line where non-significant X's are excluded may not be necessary. This means that the regression line equation developed and tested earlier is to be rejected, because all its variables, except for CRM input, have been excluded, and it is to be replaced by a linear equation that only includes one independent variable as follows:

$$\text{CRM performance} = .969 \times \text{CRM Input} + .117$$

Where the intercept is not statistically significant.

In fact, this might be a very good result given that we are adopting a process-based approach, and in such approach, the output of one process becomes the input of another process, throughout the entire system.

This is to say that the process is by definition closely linked to other inputs in the system; that is, it makes a lot of sense, beyond intuitively, that CRM input and CRM output produce statistical significance on the coefficient on CRM input. In summary, this section revisited the data analysis phase and summarized it in a behavioral manner after it has simplified its complexities and communicated the findings to managers and decision makers in the field of IT and Marketing. This section discussed two groups of ideas: Assertion of the process-based approach to model the CRM concept; and Testing of selected hypotheses associated with CRM output. It also presented how the business community can adopt our findings for greater use in their organizations for the purpose of advancing their effort of

understanding their customers, build CRM-driven loyalty, and maintain healthy generation capability of greater business value for their firms.

4.1 Managerial Implications

This section revisits the data analysis phase and summarizes it in a behavioral manner to simplify its complexities and communicate the findings to managers and decision makers in the field of IT and Marketing. We will discuss two groups of ideas: Assertion of the process-based approach to model the CRM concept; and Testing of selected hypotheses associated with CRM output. We will present how the business community can adopt our findings for greater use in their organizations for the purpose of advancing their effort of understanding their customers, build CRM-driven loyalty, and maintain healthy generation capability of greater business value for their firms.

4.2 The CRM as an international standard

“ISO 27001 uses a process-based approach, copying the model first defined by the Organization for Economic Cooperation and Development (OECD).” Informationshield

ISO/IEC 27001:2005 specifies the processes to enable a business to establish, implement, review and monitor, manage and maintain an effective information security management system (ISMS). International standards are now imposing that any new standard has to be modeled against the layout of a process-based approach. Most of the literature (<http://www.sriregistrar.com/>) claims that the ISO 27001 standard is designed to integrate the process-based approach of ISO's management system standards – ISO 9001:2008 and ISO 14001:2004. We intended that this section provides sufficient information about the importance of the process-based approach. But not every concept fits the process-based approach. Its components have to behave like process components. In our case, we had to test and assert that the CRM concept can in fact be a process-based system. The process should connect to the output, the output to the control mechanism, the control mechanism to the process, from inputs to the output, and objectives to the control mechanism. The testing of the hypotheses H1 to H7 showed that the CRM has been asserted as a process-based approach. This gives CRM adopters the capabilities to plan it, audit it, and build its integrated system by toning the objectives, the resources, the inputs, the transformation process, and the control mechanism to produce the outputs planned for it. The CRM may be developed into a standard, similar to total quality management, security management, and business continuity. Just by getting to this point, great advantages are gained in the business community because companies can now comply to the eventual CRM standard, and can get certified. One the standard is imposed on the business community by their government, by the international trade, or in voluntary manners to gain competitive advantage, customers and partners can now make educated decisions where to go to do business with.

4.3 Useful findings through correlations

Earlier, we have accepted the hypotheses G_i , $i=1, 13$, with different significance level. By examining those hypotheses, one can see that that there are many ways to achieve CRM performance. How to achieve the planned CRM performance? We may invest in better CRM change management and we can in this manner enhance CRM performance. Or we may improve some of the individual parameters constituting the probability of success and in this manner we can achieve the level of CRM performance we desire. Or we may enhance CRM applicability by diminishing all the negative effects that stand as barrier to the organization's CRM applicability, and in this manner, we can enhance CRM performance. Or we can invest in adopting adequately all known best practices which will lead to improving our CRM performance. Anyway, there are many ways to achieve the desired level of CRM performance. CRM adopters would like to understand what path they should take that lead them to higher CRM performance in more feasible ways; i.e., by minimizing costs, speeding recovery, and so on. The hypotheses G_1 to G_{13} provide some ideas of the tradeoffs that can be made to obtain the desired level of CRM performance. For example, the operational

CRM is related to best practices, and CRM adopters can improve their reliance on best practices by investing in improving some of the parameters constituting the operational CRM, the analytical CRM, or the collaborative CRM.

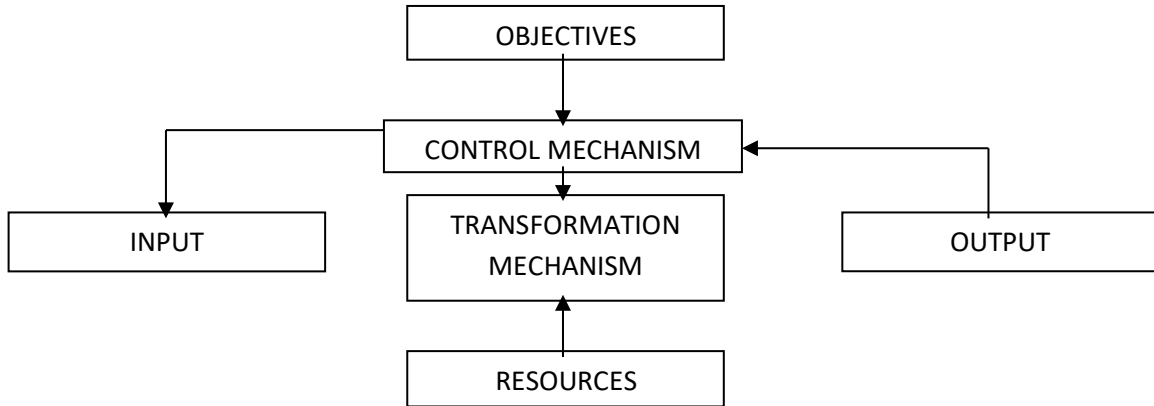


Figure 1: Generic process architecture

Source: Manel Mastouri et al, (2011).

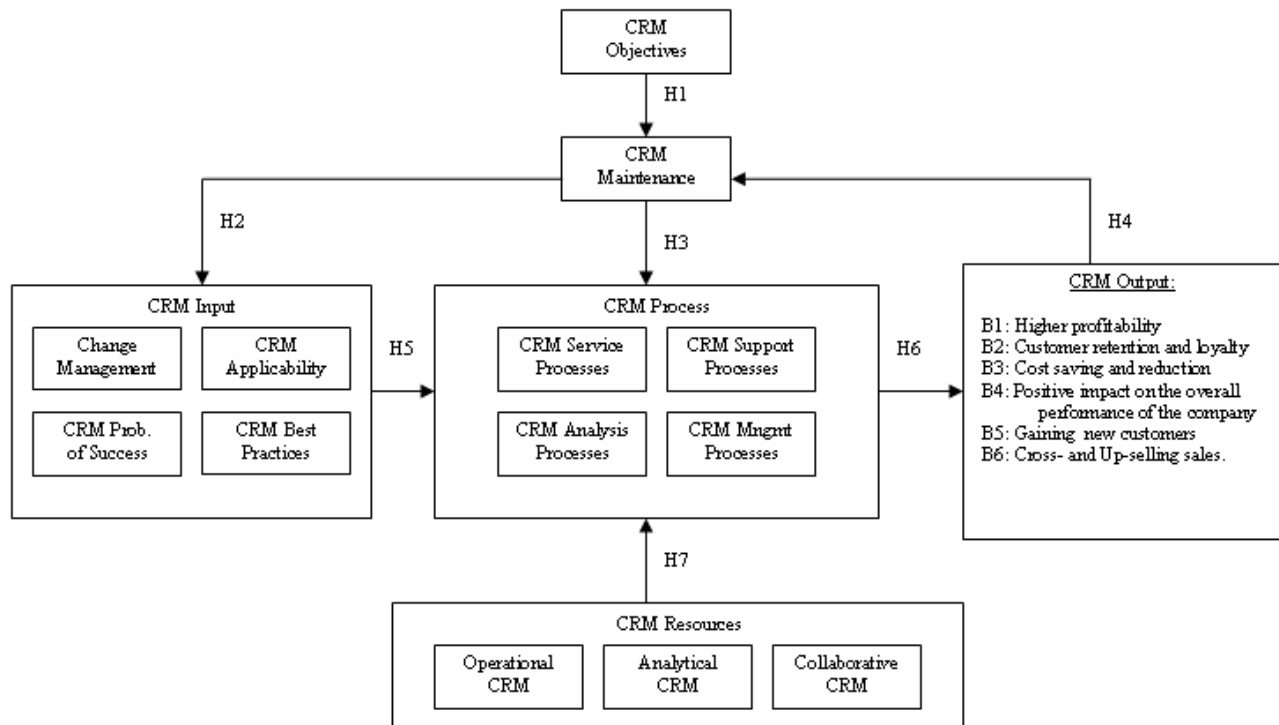


Figure 2: Testing the Process-based approach for CRM

Source: Manel Mastouri et al, (2011).

Table 1	
Independent Variables	Sig. Probabilities
X1=CRM Maintenance	.356
X2=Change Management	.028
X3=CRM Applicability	.288
X4=CRM Best Practices	.106
X5=Analytical CRM	.364
X6=Operational CRM	.510
X7=Collaborative CRM	.301
X8=CRM Reasons	.165
X9=CRM Defiance	.112

Source: Salah Boumaiza et al, (2011).

Table 2			
Variables Entered/Removed^a			
Model	Variables Entered	Variables Removed	Method
1	CRM Input	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
a. Dependent Variable: CRM Performance			

Source: Manel Mastouri et al, (2011).

Table 3
ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.927	1	7.927	70.144	.000a
	Residual	1.921	17	.113		
	Total	9.848		18		

a. Predictors: (Constant), CRM Input b. Dependent Variable: CRM Performance

Source: Manel Mastouri et al, (2011).

Table 4						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.117	.414		.282	.782
	CRM Input	.969	.116	.897	8.375	.000

a. Dependent Variable: CRM Performance

Source: Salah Boumaiza et al, (2011).

Table 5					
Excluded Variables ^b					
Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance

1	CRM Maintenance	-.025a	-.134	.895	-.033	.356
	Change Management	-.678a	-1.063	.304	-.257	.028
	CRM Applicability	-.097a	-.475	.641	-.118	.288
	CRM Best Practices	.117a	.347	.733	.086	.106
	Analytical CRM	-.100a	-.550	.590	-.136	.364
	Operational CRM	.110a	.721	.481	.177	.510
	Collaborative CRM	-.134a	-.672	.511	-.166	.301
	CRM Reasons	.165a	.615	.547	.152	.165
	CRM Defiance	-.122a	-.372	.715	-.093	.112
	Objectives	.072a	.487	.633	.121	.553
a. Predictors in the Model: (Constant), CRM Input						
b. Dependent Variable: CRM Performance						

Source: Salah Boumaiza et al, (2011).

Table 6			
Coefficient Correlations a			
Model			CRM Input
1	Correlations	CRM Input	1.000
	Covariances	CRM Input	.013
a. Dependent Variable: CRM Performance			

Source: Manel Mastouri et al, (2011).

CONCLUSION

In conclusion, customer relationship management and IT has created positive effects on businesses today both in large and small business. The ease of interaction between customers is very sure with CRM. Technology has made it possible for online orders, online complaints, online interaction, online delivery and online transfer access between customers and companies. It has created the efficiency and effectiveness of customer relationship. For any business, victorious CRM steering is becoming more and more significant in today's competitive commerce and business world.

CRM is the techniques through which businesses that attach with their clientele and serve them better. Businesses and commerce with successful CRM strategy will take in a large increase in sales, client satisfaction and finally the victory of the business. Making use of CRM technology is serious and critical to keep costs and expenditures low.

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