

The Supply Chain Role of Transaction Processing System in Customer Relationship Management

Samira Ahmed Mahdi Al-Jnabi¹

¹Department of Public management, College of Administration and Economics, University of Baghdad, Iraq

Salah Aldeen Awad Kareem²

² Department of Business Administration, College of Administration and Economics, University of Baghdad, Iraq

^{1,2}esfehani.mohamad4@gmail.com

Abstract- The aim of this study is to examine the supply chain role of the Transaction Processing System (TPS) on customer relationship management using empirical analysis. The study employed the opinions of 47 managers from selected banks in Baghdad that are known for the use of TPS through the collection and transaction store or from the decision-makers in the organizations. The result showed that there is a correlation between TPS and effective use of customer relationship management except when data are interned.

Keywords: supply chain role, customer relationship management, Transaction Processing System, data query.

1. Introduction

One of the existing information systems that collect and store transactions or decision-making is transaction processing systems. The system plays an important role in organizations specifically during the process of obtaining data that update databases and describe the business transaction. The main purpose of the TPS is to process the transaction, mainly the transactions of data entry, report and document generation, process query and database maintenance – with these processes, the organization tends to improve its relationship with the customers. Recognition of the customer importance, their supply chain roles in the success and competitiveness and services to the customers are sought by the organizations. Customers are satisfied with the organization's performance with the above-mentioned activities in addition to directing and handling transactions and inquiries of customers which are set to improve the relationship between the organization and the customers.

There is need for intellectual debate on the system of processing transactions and its roles, objectives and components, especially in the roles that are still surrounded by controversy and inconsistency despite their

performance and reflection on the justifications of the system. This subject on how to employ still has ambiguity mainly in the area of how to employ the result of the system and the tools of the effective management of the relationship. The main challenge is in the usage of the tools and the system and the result to support the impact of customer relations management and not just in the existence of the system. The following questions are required to be answered as this study seeks the need of the managers of the private banking sector of Iraq to employ this processing transaction system:

- i. At what rate is the use of transaction processing systems in banks?
- ii. What is the level of effectiveness of customer relationship management in banks?
- iii. What is the nature and level of association between the transaction processing system and customer relations management and its absence in banks?
- iv. What is the rate and effectiveness of transaction processing system on customer relationship management in banks?

This study is important with the incorporation of two variables and their importance in the success of business organizations. This importance is manifested into two folds: the scientific part which represents a critical attempt to find a common ground on the intellectual debate about customer relations management; and transaction processing system through theoretical framework. The best mechanism to be employed in the private bank is the transaction processing system in the management of customer relations.

The three sets of the objectives of this study are:

1. To diagnose the level of use of the transaction processing system in the selected banks;
2. To identify the level of effectiveness of customer relationship management in the selected banks;

3. To determine the nature and level of the impact and relationship performed by the transaction processing system on the effectiveness of customer relationship management.

2. Literature review

In the study of Hakim and [1], the aim is to measure the functions of customer relationship management as supported by the functions of customer relationship management. The quality function dissemination which is the foundation of customer relation management is used to measure the information quality in Asia Cell Communications. The most significant result indicates that there is a strong correlation between information quality and the customer relationship management processes as supported by the functioning activities using distributed questionnaire to 44 information workers.

Furthermore, [2] carried out a study in an attempt to evaluate and examine continuously the work procedure and subsequently improve on them in the mobile organizations and to provide flexibility and real exchange of work procedures in the work environment. The study employed database system analysis for the implementation of transaction processing systems of mobile phones for the year 2001 to 2005; also, how to focus of data exchange by quickly processing the data in a mobile environment. To provide mobile communication systems and share mechanism with flexibility to adapt in order to cope with the dynamic environmental change and ensure rule system and consistent data are the best solutions to the problem of handling transactions in a mobile environment. This study designed and developed a special system to process he transaction.

2.1 Transaction Processing System and its Concepts

The most important management information system is the transaction processing system as other systems rely on the situation of this system. This system has a distinguishable feature from the other systems as it only generates information directly through a complete and a large database from where the extraction of information took place. In other word, it is a computerized system that records events and routine activities in details such as payroll preparation, sales transactions, expense recording, purchase orders and other detailed activities. The natural resources such as goods and services are represented within this system which happens within the natural

channels. This indicates that the system stands for the power house of a business organization.

Moreover, there are some systems of transaction that focus on two types of applications: the first one is the core business applications, also referred to as instantaneous transaction processing applications that supports daily business activities and requires quick access. This system can only handle a small amount of data and only receive data for daily transaction at the period of the event. The second system is the application of analysis when required and being responsive to open-ended questions such as what if the system involves multidimensional analysis. The old transaction processing systems are different from the current one, especially in the case of computer which rarely produces management information. On the other hand, an accurate and comprehensive database is provided by the modern system while it reflects the speed and ease of access to some or all parts of the data with the support of database management systems.

2.1.1 Transaction Processing System and its Main Activities

This study conducted a survey giving scientific references to the dimension limitation and the activities of the transaction processing system: report generation and documentation, data entry, query processing, transaction processing and database maintenance. These activities shall be addressed in details below:

Data Entry: According to [3], in order to introduce the data to the computer by the appropriate input media module, the process of input function and data collection transaction from their original sources are converted into formatted data. The first step of the first activity is to access into the business data; the transaction cycle begins from the collection of the transaction data through the point of sale terminal using the scanner on the registered symbol on the goods and on the credit card reader. Through the website, the transaction data can be sent in electronic commerce where there is record and review to secure.

Transaction Handling: Two main ways can be approached for transaction processing: after the collection of data during a fixed period of time, transaction data is processed in a structured manner; and the real-time processing immediately the transaction is executed. With the support of the database in the form of payments, the data in the processing system is transferred from a partial system to another instantaneously or periodically upon the arrival of a transaction as the system operates automatically such as the purchase order. [4] added that a

variety of information is produced by the transaction processing systems for external and internal use such as constant updating of databases (changing names and addresses in the client file) and sales receipts checks and tax forms.

Sustainability of the Databases: the processing of trading systems should be used to perform daily updating, review and maintenance of the organization's database in order to keep data updated and intact. The database management encompasses the maintenance. In terms of display, addition, storage, deletion, retrieval and printing database operations are highly efficient for the purpose of advocating and planning effective decision such as e-service for library visitors. [5] in addition stated that the database for transaction processing system allows users to have interaction through one or more processes that can be grouped to form a program unit for implementation.

Production and generation of documents and reports: According to the modern concept of the 1960s, administrative reporting systems emerged as a planned work for the purpose of decision-making processes. Creation of a report in accordance with the data generated by transaction processing systems is the purpose of these systems. The report comprises exceptional and routine information on the activities of the organization. The management are provided management reporting systems about the organization's activities with specific information in order to assist them in decision-making processes with consistency in operations and storage. This is because they are repetitive and stable; and they require specific and consistent information as provided by management reporting systems.

Investment on the information resources **of the network:** this is the most important challenge that limits the strategic impact of the Internet. Therefore, problems such as the collection of information in an appropriate manner and the implementation of complex queries are focused on by the most advanced applications. Also, many systems of transaction allow the user to use the web browsers, intranets, database query management languages and internet to receive and direct responses and queries to the results of transaction processing activities.

2.2 Customer Relationship Management

The following section reviewed some key concept about the construct:

2.2.1 The concept and importance of customer relationship management

In the beginning of 1990, the customer relationship management was marked. Its emergence is due to the problems faced by most industries to increase in the demand of their customers for high quality and decline in the customer service. The organizations and managers are required to have a rethink on the traditional methods of providing the service in order to increase the importance of the customer in addition to the emergence of electronic methods. Furthermore, [6] stated that through the combination of direct response capabilities to customer demand, high interaction and long customer relationship support, the World Wide Web (www) has created more opportunities for business organizations to build better relationships. In another vein, customer relationship management is the ability to communicate continuously with customers using different or variety of means of maintaining constant contact with the customers. According to Boom and [7], the building and management of customer relationships by understanding, retaining and managing customer at any organizational level using the knowledge gained on customers to increase organizational efficiency and profitability is called customer relationship management.

[8] mentioned that high customer profitability, ensuring product and service consolidation, higher quality products, simpler operation, innovative value to the customer and maximizing customer retention are the benefits of customer relationship management. Additionally, plans and implementation of e-activities are carried out under the customer relationship management in order to improve the customer opportunities such as: providing information-based services, developing product strategy, creating and marketing of content and designing of new products with the aid of compatible digital media. The network technology used by the organization is aimed to optimize the value provided to customers through excellent services and information using the system of customer relationship management for modelling and predicting alternatives and to analyse that data to improve the relations of the organization.

2.2.2 The Effectiveness of Customer Relationship Management and its Dimension

[9] identified the dimensions of customer relationship management effectiveness to be Customer Knowledge, Customer Interaction and Customer Satisfaction. The dimensions are explained as follow:

Customer knowledge: The customer knowledge determines the effectiveness of customer relationship management as it is one of the basic factors of the service

delivery process. [10] added that consumer or buyer behaviour is the interpretation of knowledge of current and prospective customers. Some of these methods explain better and in details why many customers preferred a particular service; if it is through a necessity or compelling or incentives as a reward to use it or the rate of the service use. Segmentation of certain customer services into distinct characteristics is a common way to acquire customer knowledge according to criteria such as: demographics, geographical region or postal code, need or benefit, personal and psychological aspects like lifestyle, traits, behaviours or loyalty and criterion like a method of access like the internet. [11] posits that the reasons why customer knowledge is managed with good system and processes by the organization are because of constructive cooperation, better and more synchronous design of products or services, loyalty and customer commitment and early warning and competitive intelligence. The customer knowledge is the knowledge of the customer on the products and services in which he/she is interested in purchasing and the organizational knowledge that must be possessed to help the customer make a purchase decision.

Customer Value: The value that makes the customer contributes to the organization now and in the future is regarded as the customer value. The value takes into account the impact of the long-term relationship between the organization and its customers [12]. The authors discovered that customer value is the ease of ownership of the product and the product of the customer's desire (gains). In a specific period in comparison with the competitors accordingly, the customer's value represents the customer practically.

Customer interaction: This is the interactive reflection between the customer and the organization. [13] defined this very important process as the customer interaction with the organization and to know who and what the customer is from the interaction result. According to [14] if the following points are available, the companies will succeed in achieving the required interaction: personal dealing with the customer to know his personality, circumstances and habits; grant flexibility and complete freedom to the customers to choose their choice of channel of communication with the organization; and integration of means where each channel is connected with one another. To achieve interaction, there are two key approaches that can be used: the first key is the human interaction where the employee becomes intermediary between the customer and the customer relationship management; they all rely on information technology for their call centre. Second one is

the automated interaction where the customer control fully the interaction, such as the internet, electronic street stalls, ATMs or automated answering systems.

Customer Satisfaction: the focus of any organization that aims to be successful and superior in the future or now must be customer satisfaction. Customer satisfaction is a strategic objective and fundamental goal. As the change continues in the tastes and desires of customers, with high degree of competition and the complexity of the environment, the challenge to achieve this is increasing daily. Due to this fact, [15] shows that highly satisfied customers contribute to the provision of many benefits of the organization, as reported in the general Administration for the Regulation and Development of the Banking System in Sudan. When customers are satisfied, they are generally less sensitive to prices, speak well to others about the organization and maintain their loyalty for a long period of time. Also, the organization is ready to build a relationship with a customer who is fully satisfied and convinced of the need to develop, consolidate and adhere in order to resist any temptation orchestrated by the competing organization. The difficulty of measuring customer satisfaction is the biggest challenge for business organizations in this area. The expectation of the quality levels required in the product and the tastes and desires of customers' appears due to the difficulty. [16] referred to different methods of achieving customer satisfaction using technology and diversification of services by taking into account: customer care and satisfaction, complete delivery of services, dealing with customers to achieve their own demands and solve unexpected problems, first time service and reduction of waiting time on service delivery.

2.3 Relationship between the Transaction Processing System and the Effectiveness of Customer Relationship Management

Generally, the management information system plays critical roles in business processes and outlined the most crucial relationship that enhance the current and future success of any organization in its relationship with the customer. Also, six situations have to be achieved by any bank that wants customer satisfaction [17]: announcement of the bank's achievements in order for the customer to have a feeling of trust for the bank; listening to everything related to the customers and implementation of their expectations; customer service value through interaction with the customers; direct interaction with the customer and knowledge of their satisfaction; managing and

directing the bank's business in order to reach customer satisfaction; and appreciation and measurements.

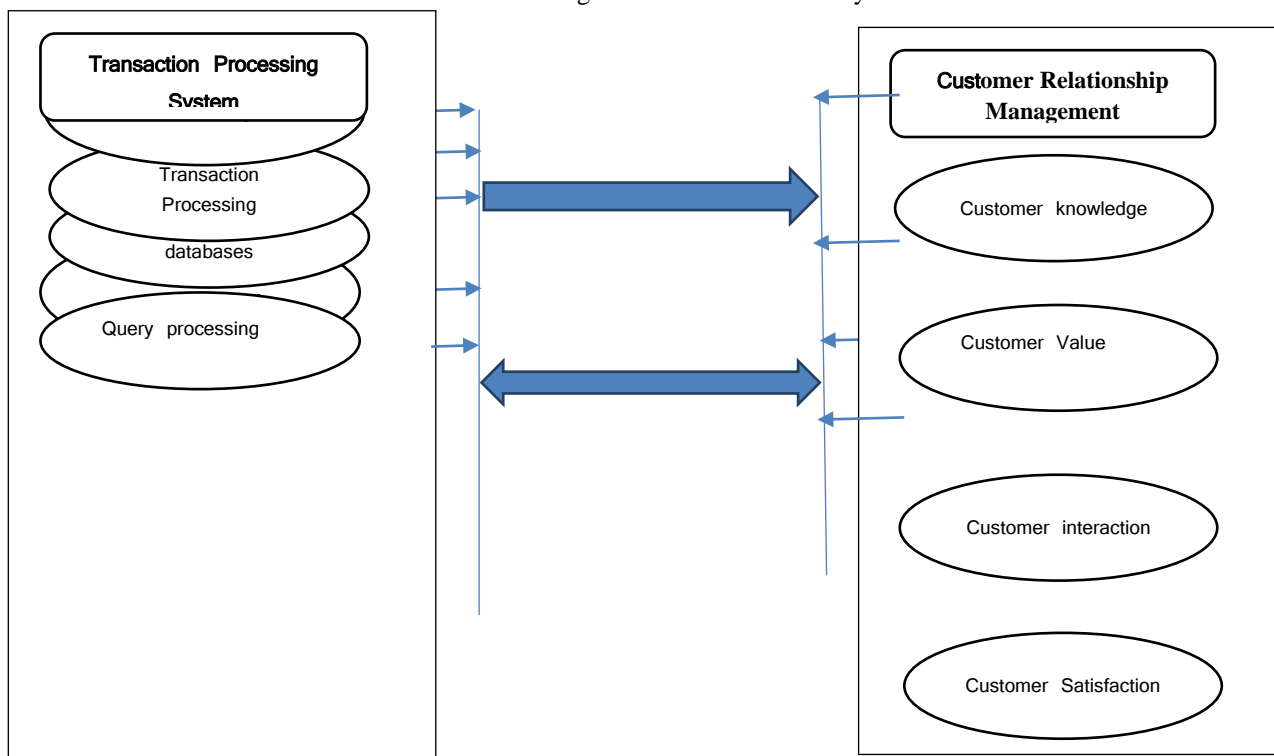
[18] noted that the IT revolution such as the internet has helped the organization to build relationships with customers as the traditional databases are no longer viable. The traditional ways have been replaced by the data repositories where a set of procedures are taken to collect customers' data and convert them into homogeneous information and data that helps to make a decision. This rule comprises contact with customers, information about transactions, static data about the customer and metadata. [19] stated that Customer Relationship Management builds the relationship with the customers through a full life cycle on the strategic use of individuals, processes, information and technology to achieve the objectives of the organization. [20] added that to integrate information stored in multiple channels and in different systems is one of the most important objectives of customer relationship management.

[21] stated Customer Relationship Management is a long-term philosophy of business with the aim of using and

collecting accumulated information about the customers with a deep understanding in order to assess the need continuously. In addition to that [20] posited that information systems are used by customer relationship management to organize all operations related to the customers such as the business surrounding the overlapping traffic of the company. By accepting customer requests and sending them to the database system, the role of intermediary is played by the transaction processing system. Then, the transactions are executed and forwarded to the customer in coordination of the transaction results; the customers judges the transaction processing systems as valid unless the transactions are not executed at an acceptable time. Similarly, facilitating the handling of data and speed in obtaining the needs of the beneficiary of different data is among the aims of the database; thus, reducing the effort and time spent.

This study employed the concepts present in the study of [16] and on the dimensions of the transaction processing system while the model is based on the study of [18].

Figure 1: The model of study



The following are the hypotheses of this study:

The first hypothesis states that: H1: an increase in the importance of customer relationship management significantly increases with the increase in the use of dimensions under the transaction processing system in private banks

H1A: there is a significant increase in the customer interaction management with increase in the efficiency of the data entry.

H1B: there is a significant relationship between an increase in the effectiveness of the customer relationship management and efficiency of the transaction processing.

H1C: significant increase in effectiveness of database maintenance leads to increase in effectiveness of customer relationship management

H1D: significant increase in the efficiency of producing and generating documents and reports leads to increases in the effectiveness of the customer relationship management

H1E: there is a significant increase in the efficiency of query processing with the increase in the customer relationship management.

The second hypothesis states that: H2: the effectiveness of the customer relationship management has a significant effect on the dimensions under the transaction processing system in private banks.

H2A: data entry has a significant effect on customer relationship management effectiveness

H2B: transaction processing has a significant effect on customer relationship management effectiveness

H2C: The sustainability of databases has a significant effect on customer relationship management effectiveness

H2D: the generation and production of documents and reports have a significant impact on the customer relationship management

H2E: the processing of the query has a significant effect on the customer relationship management effectiveness

3. Methodology

The department directors and authorized managers are the unit of analysis for the selected sample from 462 private banks in Baghdad. Nevertheless, only the management levels are related to the results. Through the analysis of the sample selected, this study made use of 47 of the private banks which are 10% total of the population.

This study is based on Kronbach alpha test for the purpose of validating the instrument items. According to [21], it is

regarded as one of the most important tools for data analysis in the statistical form. The value of the coefficient of Kronbach alpha for the items is 0.94 which shows that there is high reliability in the administrative power of the questionnaire. The acceptable basis, according to [22] for determining the coefficient of Kronbach alpha are: 0.50 - 0.70 (acceptable), 0.71 - 0.80 (good) and 0.81 and above is considered excellent. For the case of this study, the scale validity is 0.97 which shows that the credibility of the scale is excellent.

4. Result analysis

4.1 Descriptive Statistics

4.1.1 Transaction Processing System

The average mean of the total transaction processing system in the private banks is shown in Table 1 to be 3.886. This value is highly reliable as it is above the satisfactory mean of (3). The standard deviation and the total variation coefficient are 0.417 and 10.73% respectively. This shows that the employment rate is above average in the transaction processing system of the private banks, which is a recommendable result, though it is not sufficient for the challenges imposed by it and the competitiveness in the environment.

A - Data Entry: the value of this dimension is 3.644 for the general statistical mean which is above the middle and it is acceptable for the standard deviation and the general difference coefficient respective values of 0.575 and 15.78%. These values of results show that the private banks enter the data in the transaction processing system. The responses were limited to the highest value of the mean achieved. The item "the bank collects the data from the point of delivery of service" achieved 4.128 which are high in value and reliable between the lowest values of 0.711 and 17.22% respectively.

B - Transaction Processing: This dimension has a general and mathematical mean above the average value of 3.851 and it is acceptable with the values of 0.568 and 14.75% respectively for the standard deviation and the general difference coefficient. This result indicates that transaction processing is employed by the private banking sector. The item 8, "the system ensures that transactions of confidentiality and confidentiality are handled" has the value of 4.404 which is high and reliable. This reflects the value of standard deviation and coefficient of variation as 0.852 and 19.35% respectively. From the item 5, "the bank

depends on dealing with payment transactions with ease and ease”, the value is 3.575 which have a high level of acceptability with standard deviation and coefficient of difference of 0.994 and 27.80% respectively. According to this study, this result reflects above-average processing of the transactions of the selected banks.

C - Sustainability of the databases: this dimension has the general arithmetic mean of 4.096 which is high and in accordance with the value of standard deviation and the general variation coefficient as 0.60 and 14.65% respectively. These results show that databases are

maintained well by the private banks at a high level rate. This dimension is measured in item 9-12 of the questionnaire. The results were achieved between the values of the mean in the item 10, “the daily update of the data in the databases” to be 4.213 which is high in value and in accordance with the values of standard deviation and difference coefficient of 0.883 and 20.96% respectively. Item 11 “the database system allows the customer the flexibility to update its data electronically” achieved the lowest value [23].

Table 1: the values of the arithmetic mean, standard deviation and coefficient of variation in transaction processing system (n = 47)

Dimensions	Item	Transaction processing system	Mean	Standard Deviation	Coefficient of variation
Data Entry	1	The data are collected from the service delivery point by the bank	17.22	0.711	4.128
	2	The symbols for the service are used by the bank	26.36	0.948	3.596
	3	The bank relies on the credit card reader.	28.26	0.974	3.447
	4	Some customer data are received by the bank via the Internet.	35.55	1.21	3.404
Transaction processing	5	The Bank depends on handling payments transactions with ease.	15.78	0.575	3.644
	6	Real-time transaction processing (direct line) is adopted by the bank	27.80	0.994	3.575
	7	After completion of the transaction, the bank will process the data immediately	29.95	1.077	3.596
	8	The system ensures that transactions of the customer are handled securely and confidentially	26.29	1.007	3.831
Maintain databases	9	The database is periodically reviewed, maintained and fed through transaction processing	19.35	0.852	4.404
	10	Supports daily update of data in databases	14.75	0.568	3.851
	11	The database system allows customers the flexibility to electronically update their	18.29	0.747	4.085

		data			
	12	The system enables the exchange of updated data between the central calculator of the bank and branch sub-computers.	20.96	0.883	4.213
Production and generation of documents and reports	13	Transaction systems reflect various documents and types of reports.	29.58	1.158	3.915
	14	The reports always take the form of a monthly payment or salary list or audit reports.	18.92	0.789	4.170
	15	When problems arise, the system ensures electronic documentation and archiving for reference	14.65	0.600	4.096
	16	The system reflects periodic electronic reports or when ordering directly to the customer without the intervention of the staff of the bank.	21.47	0.845	3.936
Query processing	17	Internet and intranets are allowed to be used in the bank's query system.	22.60	0.875	3.872
	18	In databases, the bank uses easy query language.	25.55	1.022	4.00
	19	Queries are allowed to be directed and received immediately in the processing system.	32.87	1.189	3.617
	20	The customer inquiries are ensured to be answered by the secret query handling system	13.30	0.513	3.856
General mean, general standard deviation and general difference coefficient			19.80	0.789	3.984
Mean, standard deviation, and coefficient of variation for total transaction processing system.			10.73	0.417	3.886

D - The production and generation of documents and reports: This dimension has a value of 3.856 for the general arithmetic mean which is above the acceptable value and in good consonance with the standard deviation and the general variance coefficient of 0.513 and 13.30% respectively. The result is indications of the problem diagnosed are being reported and solutions are provided in the initiative. It shows that the investment opportunities

prepared are above the average and certainly not enough as posited by this study to fit with the depth of the challenges facing their banks. For the development, the problems require greater focus if the leaders of the sector are to promote and adapt to those challenges. The item 13 of the questionnaire is used to measure the dimension; the results were limited to the highest value achieved by item 15, "the system ensures documentation and electronic archiving for

reference when problems occur” with a value of 4.00 which is considered high and valid value that reflects the standard deviation and the variance coefficient of 2222 and 25.55% respectively. The item 16, “the system reflects periodic electronic reports or when the direct demand of the customer without the intervention of the staff of the bank” achieved the lowest value of 3.617 which is still acceptable. The standard deviation and coefficient of variance are 1.189 and 32.87% respectively.

E - Query Processing: The standard deviation and the general variance coefficient of this dimension are 0.789 and 19.80% respectively, while the value for the general arithmetic mean is 3.984 which are high. This indicates that the banks have good query processing systems. This dimension is measured in item 17 to 20 of the questionnaire. The results were limited to the highest value achieved by item 20. In response to the customer's inquiries, the secret query processing system is valued 4.106. This value is considered acceptable and high with 1.068 and 26.01% respectively for standard deviation and the general variance coefficient. Item 17, “The bank's query system allows the use of the internet and the intranet” achieved the lowest value. With the standard deviation and the difference variance around 1.146 and 30.43% respectively, the value of the item is 3.766 which is acceptable.

4.1.2 Customer Relationship Management

A general computational mean of 3.601 for the customer relationship management is shown in table 2 which is above the satisfactory mean value of 3 and acceptable. The

values of the standard deviation and the total variance coefficient are 0.692 and 19.22 respectively. The results indicate that the management of the bank gives more attention to manage their relations with the customer above the average. This is considered as an ineffective result from this study. This variable is measured with the following dimensions if they want to compete as the customer is the focus of competition in banks:

A - Customer knowledge: The response to this value shows a general computational mean of 3.60 which is above average and in good correlation with the respective values of standard deviation and the general variance coefficient around 0.776 and 21.56%. It is necessary to focus on customer-related issues as the knowledge about the customer is not enough as observed in this study. As the success in the organization depends on the efficiency of the knowledge about the customers, there is a need for the desired change. Looking at the items, the dimensions measured by items 21-25 have the answers which are limited between the highest values achieved by the item 21, “the bank takes a high level of security for the customer data”. The value is 4.149 which have high correlation with standard deviation and variance coefficient of 1.142 and 27.52% respectively. Item 23, “the current website helps the bank to develop the customer knowledge and the relationship with it” achieved the lowest value. As the website has not been used sufficiently to develop knowledge about the customer, the value is said to be logical from the point of view of this study.

Table 2: The Mean values, standard deviation, and variance coefficient for customer relationship management (N = 47)

Dimensions	Item	Customer Relationship Management	Mean	Standard Deviation	Coefficient of variation
Customer knowledge	21	High level of security in maintained by the bank for customer data.	27.52	1.142	4.149
	22	The customers of the Bank are constantly connected to its website.	31.09	1.131	3.638
	23	The current website of the bank helps to develop the customer's knowledge and the relationship with it.	37.05	1.080	2.915
	24	The Bank continuously attempts to obtain data from its customers for the purpose	31.28	1.118	3.574

		of designing the appropriate service.			
	25	The Bank informs its customers through e-mails about its new services.	32.02	1.192	3.723
Customer value	26	The bank constantly compares the value offered by the bank to what current competitors offer.	21.56	0.776	3.600
	27	The bank strives to use various electronic marketing methods for its customers.	30.54	1.033	3.383
	28	The possibility of retaining the customer increased with the service provided by the bank	34.85	1.231	3.532
	29	Easy to use and navigate within the bank's website.	32.13	1.169	3.638
	30	Based on reputation, the bank strives to create a positive customer experience	28.45	1.089	3.829
Customer interaction	31	To identify the bank, there are multiple channels of communication with the customer.	30.43	1.146	3.766
	32	The bank cares about customer time and timely response.	23.39	0.849	3.630
	33	The bank provides detailed information about the services provided and how to use them.	26.04	0.992	3.809
	34	The bank continuously updates and develops its services.	33.61	1.194	3.553
	35	The Bank is trying to provide high-level services parallel to those offered by competing banks.	29.80	1.135	3.809
Customer satisfaction	36	The means of communication and dealing with the clients are satisfactory.	31.41	1.183	3.766
	37	The bank responds to customer needs and desires as soon as possible.	29.31	1.116	3.808
	38	The services provided by the bank are commensurate with the expectations of the customers.	22.67	0.850	3.749
	39	The customers are satisfied	36.07	1.159	3.213

		with the services provided by the bank.			
	40	The management of the bank feels that satisfying the customer's needs increases his/her relationship with the Bank.	32.87	1.203	3.660
General mean, general standard deviation and general difference coefficient			23.15	0.793	3.426
Mean, standard deviation, and coefficient of variation for total Customer Relationship Management.			19.22	0.692	3.601

B - Customer Value: The response to this dimension shows that general computation is 3.63 which are above the average value and in consonance with the standard deviation and the general variance coefficient of 0.849 and 23.39% respectively. Also, the lowest value achieved by the item 26 is compared consistently with the value provided by the bank and that of the competitors with the value of 3.333 which is above the satisfactory average value slightly. The value is in correlation with the standard deviation and the coefficient of variation values of 1.033 and 30.54% respectively.

C - Customer interaction: The Table 4 represents averagely above the general value of 3.749 which indicates a good correlation to the answer with the standard deviation and general variance coefficient values of 0.85 and 22.67% respectively for the items 32-35 of the questionnaire. The answers were limited to the highest value achieved by item 31, "there are multiple channels of communication with the customer to identify the bank" with the reliable value of 3.809 which is highly correlated with the values of standard deviation and variance coefficient of 0.992 and 26.04% respectively. Item 32, "the bank is concerned with the time of the customer and respond to him in a timely manner" achieved the lowest value of 3.533; though the value is above the average value and weak correlation, but it is acceptable with standard deviation and coefficient of variance of 1.194 and 33.61% respectively. This study found that there is an interest in the average time of the customer and most banks have made positive changes in the speed of completion of transactions but they are insufficient.

D - Customer Satisfaction: The response to this dimension shows that general computation is 3.426 which are slightly above the average value and in consonance with the standard deviation and the general variance coefficient of

0.793 and 23.15% respectively. To achieve a higher level compatible with the requirements of advancement in the sector, that current stage requires the adoption of new performance methods. The items 37-40 measure the nature of the service provided by direct contact with customers; item 37 limits the answers achieved between the highest values. Therefore the item, "the bank shall respond to the needs and wishes of the customer as soon as possible" is valued 3.66 and acceptable consistency with the values of standard deviation and coefficient of variance 1.203 and 32.87% respectively. Item 36, "the means of communication and dealing with the client is satisfactory" achieved the lowest value. The value is slightly satisfactory and has a weak correlation with response, but acceptable with the standard deviation and the variance coefficient of 1.159 and 36.07% respectively.

4.2 Test of Hypotheses

Hypotheses of correlation and effect which are formed from theoretical review are tested in this section to know the relationship between the transaction processing systems. This relationship is said to have an influence on the customer relations management and the significances of the relationship are determined with a significant level of 0.05.

The relationship between the transaction processing system and customer relationship management

The first main hypothesis states that: an increase in the effectiveness of customer relationship management will significantly increase his employment of the dimensions of the system of processing transactions in private banks. Table 3 presents the result after conducting a Spearman test correlation. The results show the correlation between the two dimensions of the hypotheses.

The data entry, which is one of the dimensions of the transaction processing system, has a significant correlation with customer relationship management below 0.05 with the 20% of the total relationship. In contrary, the result is

not significant and not to the level required to validate the first sub-hypothesis which states that, “the efficiency of data entry has a significant increase on the effectiveness of customer relationship management”.

Table 3: coefficient of correlation between transaction processing system and customer relationship management (N=47)

Transaction processing system \ Customer Relationship management	Customer knowledge	Customer value	Customer interaction	Customer satisfaction	Total customer relationship management	Sig	Sig
						No.	%
Data Entry	20%	1	0.251	0.028	0.273	0.323*	0.195
Transaction Handling	100%	5	0.536**	0.350*	0.458**	0.561* *	0.393**
Sustainability of the Databases	80%	4	0.521**	0.250	0.688**	0.409* *	0.499**
Production and generation of documents and reports	80%	4	0.355*	0.405**	0.290*	0.304*	0.180
Investment on the information resources of the network	100%	5	0.572**	0.295*	0.643**	0.597* *	0.548**
Total transaction processing system	100%	5	0.663**	0.376**	0.689**	0.653* *	0.604**

The transaction processing showed 100% significant correlations with customer relationship management. The relationships are strong with a significant level of 0.01 and 0.05 in customer satisfaction. This result shows that the second sub-hypothesis, “customer significantly increases transaction processing efficiency” can be absolutely accepted.

The database persistence has 4 significant correlations which are strong at the level of 0.01 while weak or non-significant with 80% customer satisfaction on the sub-hypothesis, “increase in database sustainability significantly increase customer relationship management effectiveness”.

The production of documents and reports (4 items) showed 80% significant correlation with customer relations management. Two of the items are strong under the significant level of 0.01 with customer satisfaction while significant with customer value and interaction at the level of 0.05. This result is sufficient enough to validate the

fourth sub-hypothesis which states that, “increase in the efficiency of production and generation of documents and reports significantly increase the effectiveness of customer relationship management”.

The query processing (5 items) has a significant relationship with customer relationship management at the level of 0.01. This result supports the second sub-hypothesis absolutely which states that: “The total transaction processing system showed 100% significant correlation with customer relationship management”. The relationship is significant at the level of 0.01.

The validity of the first main hypothesis of this study is confirmed from the above results which states that, “increase in the utilization of the dimensions of the transaction processing system in private banks will significantly increase the effectiveness of customer relationship management”.

The impact of the transaction processing system on the customer relations management

From the second main hypothesis which states that: “the effectiveness of customer relationship management is significantly affected by the dimensions of the transaction processing system”. After the test of regression model between the variables, Table 4 presents the correlation between the two variables for the hypothesis validation.

The first sub-hypothesis of the second main hypothesis states that: “the data entry significantly affects the customer relationship management effectiveness”. The data observed from the Table 4 reveals that, there is no

significant effect with the R-squared value of 0.073 and the calculated value of (3.56) (0.073). The result shows that data input contributes to the interpretation of variables of customer relationship management while the beta value is 0.271 i.e. a change in one unit of data entry will make a difference. These results do not allow the acceptance of this hypothesis in the ratio mentioned in the effectiveness of customer relationship management. The hypothesis is not allowed with this result.

Table 4 presents the coefficients of regression (β , R-squared and calculated F value) for the relationship between the transaction processing system and customer relationship management.

Transaction processing system	Customer relationship management			
	B	R²	F	Significant level
Data Entry	0.271	0.073	3.56	Not significant
Transaction Handling	0.565	0.319	21.08**	Significant
Sustainability of the Databases	0.526	0.277	17.20**	Significant
Production and generation of documents and reports	0.369	0.136	7.087*	Significant
Investment on the information resources of the network	0.632	0.400	29.97**	Significant
Total transaction processing system	0.710	0.503	45.60**	Significant

* The value (f) of the table at a significant level of 0.05 = (4.04)

** The value (f) of the table at a significant level of 0.01 = (7.2)

The second sub-hypothesis of the second main hypothesis states that, the transaction treatment has a significant effect on the relationship management. The data can be observed from the Table 4 that “there is a significant effect with the value of R-squared, 0.319 and the calculated value of 21.08. These results show that the transaction processing contributes to the effectiveness of the variables of the customer relationship management with 31.9% interpretation. The value of Beta, 0.565 indicates that a change in one unit of data entry will change the ratio in the

customer relationship management effectiveness. These results, therefore, validate the hypothesis.

Also, there is a significant effect in terms of the f-value of 17.20 which is greater than the average value. The value of the R-squared coefficient is 0.277 which indicates the maintenance of the database contribution to the variables of customer relationship management effectiveness. From the value of Beta, 0.526, a change in one unit of database maintenance will lead to the change in the ratio of the value mentioned in the customer relationship management effectiveness.

The fourth sub-hypothesis of the second main hypothesis states that, “the production and the generation of documents and reports have a significant effect on the customer relations management effectiveness”. From the

data as observed in Table 4, the value of the coefficient of R-squared is 0.136 shows that the transaction process contributes to the interpretation of the customer relationship management effectiveness with 13.9% and beta value of 0.369. This implies that a change in one unit of data entry will lead to change in the ratio in the customer relationship management effectiveness. The hypothesis is allowed with this result.

The second sub-hypothesis of the second main hypothesis states that, "the processing of the query has a significant effect on the effectiveness of customer relationship management". Table 4 presents the observed data that the calculate f-value shows a significant effect, and the R-squared value is 0.40 which indicates that the transaction processing contributes to the interpretation of 40% of the customer relationship management effectiveness variable. The beta value of 0.632 means a change in one unit of data entry occurs in a change in a percentage as mentioned in the customer relationship management effectiveness. Thus, the hypothesis is accepted with this result.

The value of the calculated (F) as 45.60 shows that there is a significant relationship between the total transaction processing system and the customer relationship management effectiveness. The value is greater than the average scale and at the significant level of level (0.01) (0.503) which shows that incorporation of dimensions of the transaction processing system made a 50.3% contribution to the interpretation of the customer relationship management effectiveness. The value of Beta is 0.71 which indicates that one unit of the total transaction processing system will make a difference in the ratio as discussed in the customer relationship management effectiveness.

The second main hypothesis of this study is confirmed by the above results that states that, "the dimensions of the transaction processing system have significant effect on the effectiveness of customer relationship management".

5. Conclusion

From the above findings, the following submissions can be made:

- i. This study found that data entry have not been fully explored by the private banks in making or promoting serious change by enhancing customer knowledge, interacting with it or achieving customer satisfaction in the effectiveness of customer relationship management but has been

able to employ the variables to enhance customer values.

- ii. Also, it is revealed that the processing of transactions have been successfully explored by the management of the selected banks in order to bring promotion and positive change in the customer relationship management effectiveness. Clearly, it is apparent that the customer value and customer interaction and the overall management of customer relations are satisfied to a lesser extent.
- iii. Generally, in order to sustain the databases to promote and make radical changes in the effectiveness of customer relationship management, the management of private banks has made a good recruitment in terms of customer interaction, customer knowledge and customer, value but the management was unable to highlight the supply chain role in promoting or making a real difference of customer satisfaction.
- iv. Similarly, the process of producing and generating documents and reports in the system of transactions has been used by the management of the private banks to promote and change the customer relations management effectiveness in terms of satisfaction, value and interaction of the customers except in the case of documents and reports of the customer knowledge.
- v. In the overall analysis of these dimensions, there has been a good and unique recruitment of the query processing in the transaction system in the introduction and promotion of positive changes in the effectiveness of customer relationship management in the selected banks but the role is different in terms of customer interaction.
- vi. In general, the banks succeed in employing the overall dimensions of the transaction processing system more than when the dimensions are dealt with individually to improve or make changes in the customer relationship management effectiveness.

6. Recommendations

The following suggestion and steps are therefore recommended:

- i. In the promotion to the employment of data entry, there is need for the management of private banks to pay attention and totally bring a systematic

change in the effectiveness of customer relations management especially in the satisfaction and knowledge in terms of deportation.

- ii. There is also need to invest in the level of relationship between the way the transaction is handled and the customer relation management in the promotion in order to achieve positive change in the knowledge, value, interaction and satisfaction of the customer which lead to increase in the competitiveness as regards environmental threats.
- iii. To sustain databases in the promotion of positive changes in customer satisfaction, the management of private banks should promote serious employment. Also, between the maintenance of the database and customer relationship management, there is a need to invest in the relationship for positive change and promotion in the knowledge, value and interaction of the customer which can affect their competitiveness regarding the environmental threats.
- iv. The management of private banks should divert their attention to the need to employ documents and reports produced by the transaction processing system in order to make radical changes and promotion on the customer relationship management effectiveness especially on the matters like customer knowledge to ensure success continuity.
- v. The bank management should invest in the closeness of relationship between query process and customer relation management in order to gain customer interaction and bring positive change in the knowledge, value, interaction and satisfaction of the customers. This is reflected in the increase in the competitiveness regarding the environmental threats.
- vi. Investment in relationship of an interactive nature to changes in the effectiveness of customer relationship management and remove the transaction to the processing system. This will eventually contribute to further improve any lack or exclusion in the interaction.

References

- [1] Abadi, A., and Thamer, A. "Evaluating the effectiveness of customer relationship management using a balanced performance card - a case study thesis at Zain (Iraq) Unpublished MA. Faculty of Management and Economics. University of Baghdad. 2008.
- [2] Abu Gh., Azhar N., Abdel, Z. "Marketing Knowledge and Information Technology and their Impact on Marketing Performance, Case Study in the Southern General Company of Cement", PhD thesis, Faculty of Management and Economics, Mustansiriyah University. 2007.
- [3] Aher, N.M. "The creativity of the marketing mix and its impact on achieving marketing excellence - Case study at Al-Wissam Dairy and Foodstuff Co. Ltd". Karbala, Master of Business Administration, Faculty of Management and Economics, University of Kufa. 2006.
- [4] Ahmed, A. "Customer Relationship Management", <http://tas.wiki.com/sitemap/t-2166.html>. 2012.
- [5] Ahmed, M.S. "Electronic Management", Amman, Dar Al-Masirah. 2009.
- [6] Al-Anzi, A., Aziz, H. "Master of Management Information Systems", Saudi University, Imam Muhammad bin Saud University, Faculty of Management, Economics and Administrative Sciences, 1433.
- [7] Al-Bayati, M. "Analysis of statistical data using statistical programs SPSS", *Dar Hamed for distribution and publishing*, Amman, Jordan, 2005.
- [8] Al-Hakim, L.A., and Zwain, A.A. "Measuring the quality of job information supporting customer relationship management processes using Quality Function Publication: An Applied Study in Asiacelel Telecom Company (Najaf Branch)". *Qadisiyah Journal of Administrative and Economic Sciences*. 2009.
- [9] Al-Jarrah, A. "Customer Relationship Management", (Public Relations), University of Damascus, Faculty of Economics. 2012.
- [10] Alkhafaji, A.A., Talab, H.R., Flayyih, H.H., & Hussein, N.A. "The impact of management control systems (MCS) on organizations performance a literature review".
- [11] Al-Khafaji, O.I.A. "Management Information Technology and its Role in the Effective Management

- of Organizational Crises", *Unpublished Master Thesis Faculty of Management and Economics, University of Baghdad*, 2010.
- [12] Al-Salami, A.A.R. "Electronic Management", *Dar Wael Publishing*, Amman. 2006.
- [13] Asiri, Kh.A.J. "Difficult equation management service, customer satisfaction. And the moment of truth" *Saudi Arabia, Materials Management South*. 2012.
- [14] Awad, E.M., and Ghaziri, H.M. "Knowledge management Pearson Education inc , new Jersay. 2004.
- [15] Bakri, Th., and Sulaiman, A.H. "Management of marketing knowledge and its reflection on the relationship with the customer to achieve competitive advantage" Research presented to the second scientific conference of the Faculty of Economics and Administrative Sciences. 2006.
- [16] Bioch, O.M. "Customer knowledge, management gournal", Vol 7, No.4, 2000.
- [17] Bliujute, R., Sultenies, S., Slivinskas, G., and Jensen C. "Systematic change management in Dimensional Data warehousing". www.clteseerx.ist.psu.edu. 1998.
- [18] Boon, J.A. "Knowledge management in Business and customer relationship management international journal of information management", *Elsevier*, Ltd. Pp. 73-86, 2004.
- [19] Clarke, T., & Flaherty, A. "Country Effects on CRM Success", *Journal of Relationship Marketing*. 2005.
- [20] Evans, J.P. "Applied production and operations management": west USA, 1993.
- [21] General Administration for the organization and development of the banking system, the Department of Banking, credit data for customers of the banking system, the experience of the Central Bank of Sudan, 2010.
- [22] Handfield, R.B., and Bechtel, Ch. The role of trust and relationship structure in improving supply chain responsiveness. *Industrial marketing management*. Vol 31, No. 4, PP. 367-382, 2002.
- [23] Ellram, L.M. Supply-chain management: the industrial organisation perspective. *International Journal of Physical Distribution & Logistics Management*. Vol 21, No. 1, PP. 13-22, 1991.