A Study On Extracting Pattern Relationship Model For Crm Process In Select Private And Public Sector Banks In Trichy: Application Of Explorative Factor Analysis

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Abstract- The banking institution is one of the most unique and innovative sector regarding the economic development of India. This study has been conducted to frame the hypothesized valid construct model of CRM practices in banks. The scale construction consists of 43 statements, fewer than five dimensions Customer Acquisition, Customer Response, Customer Knowledge, Customer Information System and Customer Value Evaluation. In total 384 respondents were selected for this study on the basis of judgment sampling method. To perceive the high content validity the researcher translates the interview schedule into local language in a printed manner. The researcher have applied factor analysis to reduce the data and consider all the factors to construct and valid the model.

Keywords- CRM practices, Scale development and Pattern relationship, Judgment sampling, Explorative Factor Analysis, Discriminant Index.

I. INTRODUCTION

Banking industry is one of the major important sectors for national economic development in India. The role and contribution of banking sector in GDP is essential. Due to dynamic changes in competition as well as the needs of customer expectation have resulted, force the banks to tune their business strategies into superfluous focus on customer and satisfy them well (Day, 2000). Keeping and maintaining customer is not an easy task. But more empirical researches conducted in banking side with customer perspective (Parasuraman 2002; Payne 2006; Rootman et. al, 2008) results shows many banks developed and manage strong interaction with their customer to maximize the share of customer equity through CRM. The goal of CRM is managing the relationship; definition of CRM is varying from author to author (Brown 2000; Lu and Shang, 2007; Rootman et. al, 2008). Hussain, et. al, (2009) define Customer Relationship Management in four ways.

- 1. What to Know: CRM manages the relationship in the long run;
- 2. Target group: The targeted groups are customers who get products and services to satisfy their needs and wants;
- 3. Object: CRM enables the organization to sell their products/services to the targeted group; and Service: CRM create long-lasting relationship with their customer.

According to the above definition it should be noted that, Customer Relationship Management (CRM) in the banking sector involves reading the consumers' changing minds and needs, creating services to satisfy these needs because building and maintaining a relationship with customers in the banking industry is important for the survival. Through CRM, banks manage their services in a manner that persuade customers to use them at a profit thereby ensuring survival and success of the financial institution. Banks can increase their profits by maximizing the profitability through the total customer relationship over the period, instead of seeking to get more profit from any single transaction. In order to survive in the dynamic business environment, relationships from the differentiating factors in view of the similarity of services and this is to say that the quality of relationship differentiates from one bank to another. Therefore, it becomes imperative for service providers to meet or exceed the target customers' satisfaction with quality of services expected by them (Ashok and Kumar, 2006). Many researchers who study the CRM with customer perspective and expectation, frame the dynamic frame work on CRM (Park and Kim, 2003; Dutta, 2009). The financial sector is still lacking in research on CRM (Lu and Shang, 2007). But in recent years more empirical research has been conducted CRM in financial sector (Arun Kumar Agariya and Deepali Singh, 2012; Sanjay Kanti Das, 2012; Gisela Demo and Kesia Rozzett, 2013 Sheik Abdullah and Manohar, 2014). On the other hand there is countable number of research studies with objective to construct and frame the measurement scale for CRM practices (Sin et.al, 2005; Lu and Shang, 2007; Wang and Feng,2008; Izah Mohd Tahir, 2012; Sanjay kanti Das, 2012; Sheik Abdullah et. al, 2016). Therefore this study is undertaken to existing literature by examining and confirms the measurement of construct model for CRM practices in Banks with customer perspective. The study objectives are

- Identify the factors (which dimension) more accounted for CRM practices based on the customer perspective.
- Extracting the pattern model construct of CRM practices in banks.

II. REVIEW OF LITERATURE

In order to identify the research gap, the researcher has made the selected reviews to have an insight at the problem. The following review section offers strong discussion and argument for the selection of variables for the empirical investigation on CRM. The concept of CRM emerge due to dramatic changes in the global business environment, the paradigm of B2C has been replaced by CRM Hui -I-Yao and Kok Weikong (2011). Although CRM has now become as a powerful concept to align the interest of a firm and its customer. The focus of CRM is now shifted to how firms implement CRM to enhance profits Boulding et.al (2005). The implementation of CRM creates an urge for development and identification of key construct on CRM practices. Thus insist in need of further theoretical development (Gummesson, 2002) and also Baser et.al.(2011) to measure the perception of CRM practices should need different defining construct required. Theory building piece of work the dimension extraction is based on the definition of CRM in the initial year. Sin et.al (2005) articulated four dimension namely Customer focus, CRM organization, Technology-based CRM and knowledge management. These four dimensions extracted based on the definition of CRM. Further Lu and Shang (2007) identify six factor dimension of CRM in Freight Forwarder service. The dimension consists of Customer Acquisition, Customer Response, Customer Knowledge, Customer Information System, Customer value Evaluation and Customer Information Process. Among the six factors "Customer Knowledge" dimension has high loading factor than others. The reliable scale development to measure CRM practices not only to end itself with customer. Rootman et.al (2007) identifies two dimension attitude and Knowledge ability of employees' about CRM. The selected two dimensions have positive relationship with CRM. The author highly recommends attitude and knowledge ability of bank employees leads to good impact on CRM in banking sector. Banks have realized the importance of becoming customer oriented and therefore Customer Relationship Management

Page | 313

practices (CRM) is seen as to be very important. Hui-I Yao and Kok Weikong (2011) conducted research with three purposes to conceptualize and operationalize the CRM implementation in commercial banks, to determine whether the CRM implementation is positively associated with Customer satisfaction and to determine key moderators between CRM implementation and customer satisfaction. Based on their findings of a regression model to evaluate the criteria to measure the level of CRM implementation on customer satisfaction is predicted by three dimensions namely Acquisition, Enhancement and Recovery. Izah Mohd Tahir and Zuliana Zulkifli (2011) conducted the pilot study under five dimensions namely Customer acquisition, Customer Response, Customer Knowledge, Customer Information System and Customer value evaluation. CRM has attracted a lot attention among academicians and practitioners but as far as, in Indian contest still lacking. Sanjay Kanti Das (2012) conducted the study with ten dimension, six dimensions were explored by the research cited by Lu and Shang (2007) namely Customer Customer acquisition, Information System, Customer Value Evaluation and Customer Information Process. The results indicated there is no positive relationship in perception of CRM practices and Demographic factors. Zuliana Zulkifli and Izah Mohd Tahir (2012) developed and validating construct of Customer Relationship Management Practices. The scale instruments was adopted from the work of (Sin et.al 2005, Lu and Shang, 2007 and Rootman, 2008). After the panel recommend 48 scale statements are retained out of 51 scale statements. The result after applying the EFA for CRM construct, it has reduced to 29 statements under five dimensions. The sixth dimension Customer Information was dropped due to low loading factor. Conceptually developed and validated CRM scale catering to Indian banking sector, that help the bank managers to implement the CRM and create the attention of the unfocused area. Arun Kumar Agariya and Deepali Singh (2012) initially developed 50 scale items from the work of Agariya and Singh (2011). The critical factor identified with the help of multivariate data analysis, that identified CRM construct consists Organizational structure and Customer support, service quality, Trust, Technology, and Personalization and Market orientation. Manol Simo and Magadalena Bregasi (2013) in their empirical study identifies the four dimension that are highly caught the attention of bank employees in improvement of tools and strategies development in the banks. The exposed four factors are Customer satisfaction, Customer retention, Implementation of Hardware and Software and transparency regarding products. These four dimensions has extracted through Factor analysis with Principle Component Analysis. Gisela Demo and Kesia Rozzett (2013) develop the scale for CRM in Business to Consumer market (B2C). The main objective of this study is to develop and validate a reliable and valid CRM scale

instrument for B2C market. The authors bridge the gap version of CRM scale especially for B2C market to assess the customer perception on relationship. There are 21 scale instruments are developed based on the Rozzet and Demo (2011) works. Data collected and analysed in three different stages in the first stage 210 sample data is taken for analysis to conduct EFA (Explorative Factor Analysis) then CFA was done in the second stage, sample size of 425. At the end the scale generalization test is applied with 415 samples. Narges Dela Froos et.al (2013) aimed to analyse the outcomes of Electronic Customer Relationship Management system implementation in the banks. The author proposed model and scale consists the dimension of E-CRM initiatives, System Intrinsic success and E-CRM system goal. The instrument scales were adopted from the works of Sivaraks et.al (2011). The results of Path analysis CRM-carrying out has a positive relationship with all intergradient's of relationship. Thus claim to us good customer relationship leads to customer satisfaction.

There are so many studies have focused either in the form of customer perception on CRM and its implementation at banks. There is limited studies has conducted on the linkage of theory and scale construct. So support of the existing selected review of literatures the author develop and construct five factor dimension of CRM practices in banks based on original work of Lu and Shang (2007) followed by (Izah Mohd Tahir 2012,Sheik Abdullah et.al 2016). Here the researcher only uses the five factor dimension to construct and validate the model. Therefore only 43 statements is used for validate the model under five dimension. The studies conducted previously have not examined which dimension more accounted for CRM practices. Although the researcher also examines which dimension more accounted for CRM practices pattern construct.

III. NEED OF THE STUDY

Customer is the focal point in the development of successful marketing strategy. Marketing strategies both influence and are influenced by consumers' affect and cognition, behaviour and environment. Traditional marketing strategy is not enough to the service industry to keep their customer. Inevitably relationship marketing strategy is replacing the traditional marketing strategy in the form of Customer Relationship Management. The concept believed us, CRM is an Information technology to build long term relationship with customer (Ryals and Payne, 2001). In the banking field "A Unique Relationship" exists between the customers and the bank. But because of various reasons and apprehensions like financial burdens, risk of failure, marketing inertia etc., many banks are still following the traditional ways of marketing and only few banks are making attempts to adapt CRM.CRM seeks to establish a long term, committed, trusting and cooperative relationship with customers (Bennett, 1996).While close looking of CRM and its implementation in banks create success and failure, as to develop better understanding of CRM practices (Hussain et.al, 2009).

The efficiency of a banking sector depends upon how best it can deliver services to its targeted customers. To survive in this competitive environment and provide continual customer satisfaction, the providers of banking services are now required to continually improve the quality of services. In order to provide quality of service and continual relationship with customer, CRM is essential and vital (Bose, 2002). This study has undertaken to determine and develop five dimension factors to extract the pattern relationship of CRM Practices Scale for Banks in Virudhunagar District, Tamilnadu.

IV. RESEARCH METHODOLOGY

Sample Design

This study is descriptive in nature and to examine the customer's opinion about customer relationship management practices in banks. The district consists six blocks with total population as per 2011 census 19,42,288^[1]. The researcher identified 5 banks which has the maximum no. of branches in trichy. After identification of the branches d avoid the bios, 50 questionnaires are served to each banks they walked in. The respondents are selected on the basis of Judgment sampling method. Out of 400 respondents, only 384 respondents' questionnaires are found suitable for analysis.

Data collection Instrument

The data collected through self-administrated questionnaire. The target respondent is banks customer who have account with public and private banks in Trichy. To get a high content validity the questionnaire distributed among the customers in banks The scale statement was adapted from the work of lu and shang (2007) followed by (Izah mohd tahir and zuliana zulkifli, 2011; Sanjay Kanti Das, 2012 and Zuliana Zulkifli and Izah Mohd Tahir, 2012; Sheik Abdullah et. al, 2016) modified and suited to redefine the practices of banking sector. The researchers uses five point Likert-type scale option (5-Strongly agree to 1- Strongly disagree) to measure the perception of CRM practices.

V. DATA ANALYSIS AND VALIDITY OF THE INSTRUMENT

Multivariate statistical tools were applied to build and prove the researcher defined hypothesized construct model. In factor analysis structure deduction and confirmatory factor analysis is conducted. In the first stage of analysis the researcher applies the factor analysis.

For simplicity and convenient purpose each factor (statements) re-coded with identifiable code viz., (Customer acquisition CA, Customer Knowledge CK like that). Cronbach's alpha test was applied to know the reliability and validity of the statement. Cronbach's alpha values of 0.7 and greater is considered reliable, (straub et. al, 2004). The Cronbach's alpha values for each component are greater than 0.7 and composite alpha value for five dimension is .879, thus indicating good reliability. To know the Model fit, the KMO (Keiser-Meyer-Olkin) measures indicate the suitability of the data for structure deduction. If the KMO values high than 0.5 the data fits sampling adequacy. The present model comes with the value of KMO is .730 it is high than threshold value of 0.5. This is confirmed by the significant value yield by the test statistic Bartlett's test of Sphericity Chi- square. 1.592 df 300 P- 0.00 indicating that the variable related to the model and used to confirming author defined hypothesized construct model. After the deduction, the pattern matrix scores are used to apply the Confirmatory Factor Analysis to identify which dimension of CRM practices highly influencing.

VI. RESULTS AND DISCUSSION

Factor analysis is the mathematical form of identifying interrelated measure to find the pattern in a data set (Child, 2006). In other sense the factor analysis is the simplest form to interpret the observed data (Harman, 1976). The key concept of factor analysis is that multiple observed variables have similar patterns of responses because they are all associated with a latent (i.e. not directly measured) variable

Factor analysis is a data reduction technique that uses correlation between data variable. Factor analysis is widely used in psychology, social sciences and marketing studies. It assumes that some underlying factors exist that explains the correlation or interrelationship between the observed variable/factors. Analysis of the data in this study with the application of factor analysis, followed the approach used by Simon Gyasi Nimako (2012). That step consist Data reduction/structure deduction, Grouping the items and Confirmatory factor analysis to validate the reduced dimensions. There are two methods to conduct the factor analysis such as Exploratory Factor Analysis (EFA) and

Page | 315

Confirmatory Factor Analysis (CFA). CFA attempts to confirm hypotheses and uses path analysis diagrams to represent variables and factors, whereas EFA tries to uncover complex patterns by exploring the dataset and testing predictions. Moreover Exploratory Factor Analysis (EFA) technique used in two ways, first one the researcher may reduce large number of variable from the data set within each factor and uses it for deducting the factor dimension. The researcher may conduct EFA or CFA, it based on their research assumption. EFA is used when a researcher wants to discover the number of factors and which factor influencing more (De-Coster, 1998). A basic hypothesis of EFA is that there are common 'latent' factors to be discovered in the dataset, and the goal is to find the smallest number of common factors that will account for the correlations (McDonald, 1985). In the present study the researcher has to conduct both factor analysis techniques to confirm the validated scale for CRM practices followed by banks in Virudhunagar district. In order to identify the pattern relationship EFA is useful when the underlying dimension used for empirical result. The set of 42 scale items used to measure the opinion of the respondents towards CRM practices followed by the Banks in trichy city. The Likert five point scale item used to measure the opinion level. The scale item consist 5 marks to Strongly Agree and least mark 1 is to Strongly Disagree. Before going to conduct the factor analysis, the researcher should fulfill the reliability and validity issues of the data set.

RELIABILITY AND VALIDITY CRITERION

In order to establish the strength of the factor analysis solution, it is essential to establish the reliability and validity of the obtained reduction. For simplicity and convenient purpose each factor (statements) re-coded with identifiable code viz., (Customer acquisition CA, Customer Knowledge CK like that). Cronbach's alpha test was applied to know the reliability and validity of the statement. Cronbach's alpha values of 0.7 and greater is considered reliable, (straub et, al. 2004). The Cronbach's alpha values for each component are greater than 0.7 and composite alpha value for five dimension is .879, thus indicating good reliability. After considering the reliability issue the researcher should determine, the analytical data set is reliable for conducting the EFA. If any notice at this stage the researcher again resolves to rerun the analysis. First the researcher considers the pattern relationship among the factors though the correlation matrix. The correlation is +/-.3the factor are lower relationships with others. Furthermore the correlation co-efficient is +/-.9 indicate the data is suffer due to Multicollinearity. Suppose the correlation is more than .9 the researcher will need to determine the item that is causing the problem and remove it from the analysis. In the present case the sample doesn't face any low pattern relationship as

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well as Multicollinearity index. The correlation values are more than 0.3 and less than 0.9 therefore the researcher has uses all the factors for further analysis to strengthen the underlying assumptions. (Refer Table No,1)

KMO AND BARTLETT'S TEST

Table 1						
KMO and Bartlett's T	KMO and Bartlett's Test					
Kaiser-Meyer-Olkin M Adequacy.	Measure of Sampling	.742				
Bartlett's Test of Sphericity	Approx. Chi-Square Df Sig.	3.230E3 861 .000				

Source: Computed Data

The KMO measures the sampling adequacy; this test is based on the correlations and partial correlations of the variables. The value of KMO should be close than 0.5 for a satisfactory factor analysis to proceed. Kaiser (1974) recommend 0.5 (value for KMO) as minimum (barely accepted), values between 0.7-0.8 acceptable, and values above 0.9 are superb. The value of test statistic is given in Table 1, as 0.742 which means the factor analysis for the selected variables is found to be appropriate to the data.

Bartlett's test is another indication of the strength of the relationship among variables. This test is to test the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is matrix in which all of the diagonal elements are close to 0. From the Table, the Bartlett's Test of Sphericity test value is 32.30 at Degrees of freedom 861.That significant level is less than 0.05. In fact, it is actually 0.00, i.e. the significance level is small enough to reject the null hypothesis (p<0.05). This means that correlation matrix is not an identity matrix (there exist correlations between the variables).

COMPONENT MATRIX AND ROTATED FACTOR MATRIX

The Principle Component Analysis method of factor analysis extracted five factor dimensions of CRM practices in Banks. This component matrix is expressed as standardized variables in term of factors. These co-efficient values used to calculate respondents factor score in each dimension. In other sense they indicate how much the weight case assigned for each variable in the extracted factors (grouped factor). Rotated factor loadings are important for the interpretation of the factors (Field 2000). For analytical convenient the researcher moves to rotated matrix because Factor Matrix shows the factor loadings prior to rotation whereas the Rotated Factor Matrix shows the rotated factor loadings. In order to interpret the results, a cut-off point is decided. There is no hard and fast rule to decide the cut-off point, but generally it is taken above 0.5. If the extracted factor loading is less than 0.5 or the extracted factor cross loaded with other is eliminated by the researcher, the selected factors are used for further analysis. Table 2 shows the extracted rotated factor matrix of the model. The variables which identify with each of the factors were sorted in the decreasing order and are highlighted against each column and row.(Refer Table NO2)

Table 2						
Rotated Component Matrix ^a						
a	Component					
Statements	1	2	3	4	5	
CA1	.528	.030	050	.248	151	
CA2	.696	.029	038	.116	.027	
CA3	.695	.094	.116	.183	059	
CA4	.742	054	.011	.059	.098	
CA5	.784	047	004	.102	001	
CA6	.688	078	.160	.027	.058	
CR1	.016	.041	.793	125	.208	
CR2	.302	043	.052	.008	030	
CR3	.027	.121	.781	108	.043	
CR4	.206	.158	.771	129	.065	
CR5	.056	.093	.773	145	.108	
CR6	.369	.002	.841	.324	.532	
CR8	069	.405	.739	044	.463	
CR9	.119	.290	.271	.359	.143	
CK1	068	.971	.214	.109	.108	
CK2	.034	.686	109	.210	.115	
CK3	.050	.756	.103	.109	.424	
CK4	.069	.691	.395	074	.498	
CK5	.041	.138	.521	.068	.341	
CK6	048	.277	.410	.133	.180	
CK7	066	.330	.164	.095	126	
CK8	052	.306	.047	.308	.137	
CK9	.021	.616	.086	.255	.017	
CIS1	.123	.369	.125	.075	.628	
CIS2	.092	.244	.365	.002	.501	
CIS3	.098	.320	.120	162	.602	
CIS5	.058	.101	.235	006	.674	
CIS6	038	.155	.045	.133	.576	
CIS7	090	.314	.148	.023	239	
CIS8	.097	.025	.342	.634	.156	
CIS9	.030	.028	.654	.096	.947	
CIS10	.013	.230	009	.080	.430	
CVE1	.049	.062	.147	.688	.047	
CVE2	.006	.190	.153	.505	.048	
CVE3	.089	.198	.313	.626	091	
CVE4	.048	.141	002	.653	041	
CVE5	.144	.377	.415	.572	223	
CVE6	140	.196	.326	.782	049	
CVE7	.005	023	.002	.045	.380	

CVE8	050)026	047	.55	4 .354	
Source:	Principal	Component	Rotated	Factor	Matrix (SPSS	5
Output)						

From the rotated factor matrix Table 2 some of the factors are omitted bv the researcher that are CR2,CR7,CR9,CK5,CK6,CK7,CK8,CIS7,CIS8,CIS10 and CVE7, due to low loading. Naming of factors is more of an 'art' as there are no rules for naming the factors, except to give names that best represent the variables within the factors but in this study the researcher conduct the EFA for five factor dimension of CRM practices. Therefore, the researcher no need to naming the latent factor with its variables instead the following Table 3 shows the Five factor extracted dimension of CRM practices and its loading information on each dimension (Refer Table NO 3).

Table 3

Five factor extracted Dimension of	CRM	practices
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CRM Dimension	Recod e	Averag e Factor loadin g	Percenta ge of variance explained	Alpha co- efficie nt
Customer	C۸	688	23.08	878
Acquisition	CA	.000	25.00	.070
Customer	СК	744	12.86	863
knowledge	CK	./++	12.00	.005
Customer	CP	777	17.86	854
Response	CK	.///	17.00	.054
Customer value	CVF	626	8 33	767
evaluation		.020	0.55	.707
Customerinformati	CIS	648	9 44	773
on system		.0-0	2.77	.115

Source: SPSS Output

The researcher has to conduct Explorative Factor Analysis (EFA) techniques to confirm the validated scale for CRM practices followed by banks in Virudhunagar district. While conducting the EFA the researcher uses the entire sample used to conduct the EFA for validating pattern relationship model of CRM practices. After the extracted pattern the factor score used to conduct discriminant correlation. This shows the degree in which a latent construct distinct from other latent constructs. The successful evaluation of discriminant validity shows that a construct of the model is not highly correlated with other construct in the same model. There is no standard value for discriminant validity. If the correlation between exogenous constructs is should not exceed 0.85. The correlation value exceeding 0.85 indicates the two exogenous constructs are redundant or having serious multicollinearity problem. Therefore it is essential to compute the discriminate validity of five factor dimension of CRM practices model. The Discriminant Validity Index Summary presented in (Refer Table 4.)

Table 4

Discriminant	Correlation	Index	Summary
, _,			

Dimension	CA	CR	СК	CIS	CVE
CA	.688				
CR	.45	.744			
СК	.17	.12	.777		
CIS	.09	.01	.07	.626	
CVE	.13	.11	.41	.32	.64

Source: SPSS output

The bolded values are square root of **Average Variance Extracted (AVE)** of each dimension. Other values are inter-correlation among the latent factor dimension. it is clear that no one latent factor correlation is more than 0.85, therefore the researcher may confirm the present five factor model doesn't affected by multicollinearity index.

SUGGESTION AND RECOMMENDATION

In Exploratory Factor Analysis (EFA), the high loaded factor is customer acquisition (23.08), followed by customer response (17.86), customer knowledge (12.86), customer information system (9.44) and customer value evaluation (8.33). Therefore, the bank should concentrate more on customer information system and customer value evaluation.

While extracting the pattern relationship among the five dimensions of CRM practices. Customer Value evaluation dimension is least loading dimension in the CRM practices construct. The value evaluation is very essential part of customer life cycle, if the bank concentrated well in the customer value evaluation dimension. It develop and enduring long lasting relationship with customer thereby ensuring profitability at right time with huge customer base.

- As to managerial implication the bank manager might use "*CRM Five Factor Model*" validated scale instrument to evaluate and better understating of CRM practices. Thus offer and create high loyalty among customer and create long term profitable relationship.
- From the academic point of view further research is needed to identify new validated scale for CRM practices. The identification of why customer acquisition dimension is highly influencing

dimension than others is beyond the scope of this research.

VII. CONCLUSION

Every industry in India moves to product to customer centric approach, because customers are focal point. Higher profitability can be achieved through long-term relationship. The banking industry is not an exceptional case. Due to poor customer loyalty and arrival of new banks, also offering new services with higher service quality render by the banks to their customer. So retaining and maintaining of existing customer is very struggle to the bankers. The banks take much effort to educate their customers about CRM because CRM is an effective tool in supporting and boosting services in the era of hypercompetitive world. For this there is higher need for the CRM in Banks. Hence, sincere effort has been made to analyse and construct the valid scale for CRM practices in banks. The aim of this research is to develop and validate the extract the pattern relationship among the dimension of CRM practices in banks. The selected dimensions are employed and devised from the existing empirical study conducted in financial sector. Although the findings of the present study pinpoint the validated scales are statistically significant and measure the pattern relationship.

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