

## **Integrating Predictive CRM Analytics and Service Excellence to Enhance Customer Retention in Banking**

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### **Abstract**

This study is about how businesses can use data to make customers happy and keep them coming. In today's world, companies need to know what customers want and build relationships that last. Predictive CRM analytics helps businesses use customer information to see what they buy, what they might buy next, and how to keep them from going. The study used a survey with 147 people and special software like MS Excel and SPSS to look at the data. It found out that when businesses use CRM analytics well, they understand their customers better. They can also spot customers who might stop buying from them and help employees get better at using CRM tools. The study also says that getting customers to buy again is not just about making them feel special or building a relationship. There are things that matter too. So using data to understand customers is still a great way to make them happy, loyal, and likely to stick around. Predictive CRM analytics is a strategy for businesses. It helps them keep customers and make them happy. Customer loyalty and retention are very important for businesses. Predictive CRM analytics helps businesses achieve these goals.

**Keywords:** Predictive CRM Analytics, Customer Retention, Banking Services, Service Excellence, Customer Relationship Management, Customer Loyalty, Predictive Modeling, Customer Churn, Data-Driven Banking, Customer Satisfaction.

### **1 Introduction**

In today's world, companies are facing a lot of competition. They really need to keep their customers happy to stay in business. With the internet and all the information available, customers are very smart. They know what they want. They can choose from different companies, so businesses have to be really good at keeping them satisfied. To do this, companies are using something called Customer Relationship Management analytics. This is a way of using customer data and special computer programs to guess what customers will do in the future. It helps companies come up with plans to keep their customers loyal. Nowadays, customers want to feel special. They want companies to treat them like individuals. They want service and they want to feel like they are getting a good deal. Since there are many companies selling similar things, the ones that are really good at treating their customers well are the ones that stand out. Predictive analytics is a tool that helps companies understand what their customers like and what they do not like. It helps them figure out which customers are the valuable and which ones might leave. Then companies can come up with plans to

keep those customers happy. This helps companies build relationships with their customers and make them happy.

Using Customer Relationship Management analytics is also a good way for companies to make sure they are doing what is best for their customers. It helps them make decisions and be more efficient. Companies like banks, stores and phone companies are using Customer Relationship Management analytics to make their marketing better to provide good service and to keep their customers happy.

The best thing about Customer Relationship Management analytics is that it helps companies figure out what their customers need before they even ask. Companies can use tools to group their customers together talk to them in a way that makes sense and solve their problems quickly. This makes customers happy. It helps companies build trust with them. It is also cheaper to keep customers than to try to get new ones so companies are really focused, on keeping their customers happy.

## **2 Review of Literature**

Recent studies show that predictive CRM analytics is really important for keeping customers loyal and making them stay with a company. A study by Ejaz and Gimah in 2024 called Predictive Analytics for Customer Retention explains how machine learning models like forest and gradient boosting can find customers who are likely to leave and help companies keep them. The study found that these models can be very accurate and help companies take action to make customers happier and stay with them longer.

Similarly Mamun did a review of studies on machine learning and customer retention in 2025. He found that predictive analytics helps companies see when customers are about to leave and make plans to keep them. He also said that techniques like SHAP and LIME are important for making decisions that're clear and easy to understand.

A newer study by Latif and others in 2026 looked at how to predict customer loyalty by looking at all the information about a customer. They found that by combining data on what customers do how they feel and what they say companies can find out when customers are about to leave and make them happier with messages.

Rainy studied CRM systems that use intelligence in 2025 and found that predictive analytics is crucial for keeping customers happy and making them stay. He said that AI-driven CRM systems make customers happier and help businesses do better in the run. Another study by El-Fotouh and Akanbi in 2024 looked at how predictive analytics and machine learning affect service industries. They found that these technologies make customers happier improve service quality and keep customers loyal by helping companies engage with them in a way.

Dudeja and others said in 2019 that CRM systems that use analytics help companies build strong relationships with customers and keep them from leaving. They do this by finding out what makes customers tick and using that information to make them happy.

Predictive CRM analytics is really good, at helping companies understand customer behavior and make them stay.

## **Research Objectives**

- To learn about CRM analytics and why it matters in today's business world.
- To understand how predictive analytics helps businesses know their customers better.
- To check how predictive CRM analytics affects customer loyalty.
- To evaluate how predictive analytics can help businesses keep their customers.
- To suggest ways to use predictive CRM analytics to build stronger customer relationships.

## **3 Research Methodology**

### **Research Design**

This study uses an approach to look at how Predictive CRM Analytics helps keep customers loyal and coming back. We started with what we know about Customer Relationship Management, Predictive CRM Analytics and how customers behave. Then we made some guesses. Tested them.

### **Sources of Data**

- The primary data is what we got from people who answered our questions.
- We made a list of questions and people filled them out using Google Forms.

### **Sample size**

147 Respondents

### **Sampling technique**

Convenience sampling

### **Data Collection Instrument**

**Demographic Profile:** This section included questions about Age, gender, occupation, Industry type

**Predictive CRM Analytics Scale:** This section had 12 questions that measured how aware and what respondents thought about analytics, personalized recommendations, predicting customer behavior and strategies to retain customers.

### **Data Analysis Procedure**

The data we collected was looked at using MS Excel and SPSS. We used these tools to understand the data. The following analysis were used for testing

- **Correlation Analysis:** Pearson correlation was used to identify the relationship between predictive CRM analytics and customer loyalty variables.
- **Regression Analysis:** Multiple regression was used to determine the impact of predictive CRM analytics dimensions on customer loyalty and retention.

#### 4 Analysis

**Table 1 Profile of the respondents**

| Descriptive Statistics |      |                |     |
|------------------------|------|----------------|-----|
|                        | Mean | Std. Deviation | N   |
| Gender                 | 1.42 | .496           | 147 |
| Age                    | 2.33 | .528           | 147 |
| Occupation             | 2.13 | 1.142          | 147 |

**Table 2 Correlation Analysis**

|            |                     | Gender | Age    | Occupation |
|------------|---------------------|--------|--------|------------|
| Gender     | Pearson Correlation | 1      | .009   | .218**     |
|            | Sig. (2-tailed)     |        | .916   | .008       |
|            | N                   | 147    | 147    | 147        |
| Age        | Pearson Correlation | .009   | 1      | .280**     |
|            | Sig. (2-tailed)     | .916   |        | .001       |
|            | N                   | 147    | 147    | 147        |
| Occupation | Pearson Correlation | .218** | .280** | 1          |
|            | Sig. (2-tailed)     | .008   | .001   |            |
|            | N                   | 147    | 147    | 147        |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The table shows how gender, age and occupation are connected for the people we asked. Gender and occupation have a positive connection with a value of 0.218 and a significance level under 0.01. This means that gender and occupation are linked, but not very strongly. Age and occupation have a positive connection with a value of 0.280 and a p value less than 0.01. So occupation changes a bit based on age. There is no connection between gender and age with a value of only 0.009 and a p value over 0.05. In general occupation is a little related, to both age and gender. These relationships are not very strong. The connections are there. They do not explain much. We can see that age and occupation go together a bit and gender and occupation go together a bit too. Age and gender do not really go together.

**Table 3 Mean – descriptive statistics**

|                                                                                      | Mean | Std. Deviation | N   |
|--------------------------------------------------------------------------------------|------|----------------|-----|
| My organization effectively uses CRM analytics to understand customer behavior.      | 3.45 | .621           | 147 |
| Predictive CRM tools help identify customers who may stop purchasing.                | 3.93 | .741           | 147 |
| Employees in my organization have the skills to use CRM analytics tools effectively. | 3.98 | .815           | 147 |

Table 4 Correlation Analysis

| Correlations                                                                         |                     |                                                                                 |                                                                       |                                                                                      |
|--------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                      |                     | My organization effectively uses CRM analytics to understand customer behavior. | Predictive CRM tools help identify customers who may stop purchasing. | Employees in my organization have the skills to use CRM analytics tools effectively. |
| My organization effectively uses CRM analytics to understand customer behavior.      | Pearson Correlation | 1                                                                               | .178*                                                                 | .167*                                                                                |
|                                                                                      | Sig. (2-tailed)     |                                                                                 | .031                                                                  | .043                                                                                 |
|                                                                                      | N                   | 147                                                                             | 147                                                                   | 147                                                                                  |
| Predictive CRM tools help identify customers who may stop purchasing.                | Pearson Correlation | .178*                                                                           | 1                                                                     | .054                                                                                 |
|                                                                                      | Sig. (2-tailed)     | .031                                                                            |                                                                       | .515                                                                                 |
|                                                                                      | N                   | 147                                                                             | 147                                                                   | 147                                                                                  |
| Employees in my organization have the skills to use CRM analytics tools effectively. | Pearson Correlation | .167*                                                                           | .054                                                                  | 1                                                                                    |
|                                                                                      | Sig. (2-tailed)     | .043                                                                            | .515                                                                  |                                                                                      |
|                                                                                      | N                   | 147                                                                             | 147                                                                   | 147                                                                                  |
| *. Correlation is significant at the 0.05 level (2-tailed).                          |                     |                                                                                 |                                                                       |                                                                                      |

The results show that using CRM analytics well helps to find customers who might stop buying. This link is positive with  $r$  to 0.178 and  $p$  less than 0.05. It also helps employees to be skilled in using CRM analytics tools with  $r$  to 0.167 and  $p$  less than 0.05. The effective use of CRM analytics and employee skills in using CRM analytics tools are related. However predictive CRM tools and employee skills do not have a link with  $r$  equal to 0.054 and  $p$  greater than 0.05. In short companies that use CRM analytics well can predict which customers might stop buying and make their employees more skilled at using these tools. CRM analytics helps businesses to identify customers who may stop purchasing and improve employee skills. This means organizations using CRM analytics are better, at predicting customer churn and improving employee competency with CRM analytics.

Table 5 Regression analysis – Model Summary

| Model                                                                                                                                                                | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|-------------------|----------------------------|
| 1                                                                                                                                                                    | .122 <sup>a</sup> | .015     | .001              | .838                       |
| a. Predictors: (Constant), CRM analytics strengthens long-term relationships with customers., My organization uses customer data to personalize offers and services. |                   |          |                   |                            |

The model summary tells us that there is a weak connection between the variables we picked and people making repeat purchases. We can see this because the  $R$  value is 0.122, which's very low. The  $R$  Square value is 0.015 so that means these variables only explain 1.5% of why people make repeat purchases. The Adjusted  $R$  Square value is 0.001, which's also very

low. This shows that the model is not very good at explaining why people make repeat purchases. So repeat purchases are influenced by factors and these other factors are more important than the variables we selected. Repeat purchases are not really affected by the variables we chose other things have an impact, on repeat purchases.

**Table – 6 Regression analysis – ANOVA**

| Model                                                                                                                                                               |            | Sum of Squares | df  | Mean Square | F     | Sig.              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|-----|-------------|-------|-------------------|
| 1                                                                                                                                                                   | Regression | 1.517          | 2   | .758        | 1.080 | .342 <sup>b</sup> |
|                                                                                                                                                                     | Residual   | 101.150        | 144 | .702        |       |                   |
|                                                                                                                                                                     | Total      | 102.667        | 146 |             |       |                   |
| a. Dependent Variable: Predictive CRM analytics increases repeat purchases from customers.                                                                          |            |                |     |             |       |                   |
| b. Predictors: (Constant), CRM analytics strengthens long-term relationships w4h customers., My organization uses customer data to personalize offers and services. |            |                |     |             |       |                   |

The ANOVA table shows an F value of 1.080 and a significance value of 0.342. The p-value is than 0.05 so the regression model is not significant. This means the variables chosen do not have an effect, on repeat purchases together. Therefore, the model is not a predictor of repeat purchases.

**Table – 7 Regression analysis – Coefficients**

| Model                                                                                      |                                                                        | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. | Collinearity Statistics |       |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
|                                                                                            |                                                                        | B                           | Std. Error | Beta                      |        |      | Tolerance               | VIF   |
| 1                                                                                          | (Constant)                                                             | 4.019                       | .529       |                           | 7.593  | .000 |                         |       |
|                                                                                            | My organization uses customer data to personalize offers and services. | .077                        | .090       | .071                      | .853   | .395 | .998                    | 1.002 |
|                                                                                            | CRM analytics strengthens long-term relationships w4h customers.       | -.106                       | .092       | -.096                     | -1.156 | .250 | .998                    | 1.002 |
| a. Dependent Variable: Predictive CRM analytics increases repeat purchases from customers. |                                                                        |                             |            |                           |        |      |                         |       |

The number that shows how much personalization matters is a little positive it is 0.077. However the p-value is 0.395. Personalization is not really important. The number for long-term relationship strengthening is negative it is -0.106. The p-value for this is 0.250 which means it is also not important. Personalization and long-term relationship strengthening do not have an effect, on customers buying from us again.

Table – 7 Regression analysis – Collinearity Diagnostics

| Model                                                                                      | Dimension | Eigenvalue | Condition Index | Variance Proportions |                                                                        |                                                                  |
|--------------------------------------------------------------------------------------------|-----------|------------|-----------------|----------------------|------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                                            |           |            |                 | (Constant)           | My organization uses customer data to personalize offers and services. | CRM analytics strengthens long-term relationships w4h customers. |
| 1                                                                                          | 1         | 2.952      | 1.000           | .00                  | .00                                                                    | .00                                                              |
|                                                                                            | 2         | .037       | 8.960           | .00                  | .49                                                                    | .47                                                              |
|                                                                                            | 3         | .011       | 16.133          | 1.00                 | .51                                                                    | .53                                                              |
| a. Dependent Variable: Predictive CRM analytics increases repeat purchases from customers. |           |            |                 |                      |                                                                        |                                                                  |

The VIF value for both variables is 1.002, which's really close to 1. This means that the VIF value for the variables does not show any problems. The VIF value for the variables tells us that there is no multicollinearity issue between the variables. The tolerance values are also fine. So the tolerance values and the VIF value for the variables are within the limit. This means that the VIF value for the variables and the tolerance values are good. Therefore both variables are good to use in the regression model with the VIF value, for the variables.

## 5 Findings and Suggestions

The study found that predictive CRM analytics really helps organizations understand what customers like and what they do not like. Organizations that use CRM analytics in a way can find out which customers are going to stop buying from them. It was also seen that people who work for organizations get better at using CRM tools when their organization starts using analytics systems. There is a connection between using CRM analytics and trying to keep customers. However just making things personal and trying to have a relationship with customers does not make them buy from you again. This is because customers think about things like the price how good the service is, if they can trust you and if they like the product. The study did not find any problem with the variables that were chosen. This means that the variables were okay to use. Overall predictive CRM analytics is very useful for making decisions and for getting customers to engage with you. So organizations should spend money on advanced predictive CRM tools to know what customers need and to train their employees to use these tools and analytics in a good way. Businesses should make sure their products are good and their service is good. Then they can also make things personal for their customers. This will help customers buy from them again. Companies should always be looking at what customers are saying and what they are complaining about so they can stop customers from leaving. Organizations should start customer loyalty programs. Reward systems to keep customers. They should also use data to make marketing campaigns that are targeted at the people. The people, in charge should always be looking at how their CRM is doing and change their plans if they need to because what customers want can change. Maybe

someday there will be studies that use more people and more variables to get even more accurate results.

## 6 Conclusion

The study shows that predictive CRM analytics is very important for improving customer loyalty and customer retention. Predictive CRM analytics helps businesses to understand what customers like and what they will need in the future. By looking at customer data companies can see when a customer might leave and do something about it to keep the customer. This helps businesses make plans to keep customers happy. Even though making customers feel special and building a relationship with them is important it is not enough to make them come back. Predictive CRM analytics gives businesses an understanding of customers so they can make good decisions. Businesses can use this understanding to offer customers things they really want make customer service better and make marketing plans that customers will like. Companies that use CRM analytics well do better than their competitors. They make customers happy customers trust them and they have relationships with customers that last. So predictive CRM analytics is an useful tool for businesses that want to keep growing. It helps businesses keep customers make money and be successful for a long time in a market with a lot of competition. Predictive CRM analytics is good, for customer retention and customer loyalty.

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