

CUSTOMER RELATIONSHIP MANAGEMENT: FACTORS AFFECTING OVERALL RATING OF PRIVATE BANKS

Prof. Vilas K. Chaudhari

Dean – Operations & Chairperson, SIES College of Management Studies, Navi Mumbai,

Abstract: Customer Relationship Management is no longer a business luxury, but it is a necessity which separates one organization from the other. Its application is very evident in the banking sector, especially private banks, where the success is measured by the number of loyal customers earned rather than the transactions and turnovers. In this paper, we have tried to see the impact of various factors on the overall customer satisfaction with his/her respective private bank in Pune district, and the impact of online, internet and mobile-based services on the customer relationship management. We also briefly touched upon electronic customer relationship management or eCRM, which will surely be the future of banking services.

Keywords: Customer, satisfaction, Pune, eCRM.

Introduction:

Customer Relationship Management is no longer a new or recent term. We are hearing and applying it for a considerably long time. Kennedy (2006) defines Customer Relationship Management as a method “about identifying a company’s best customers and maximizing the value from them by satisfying and retaining them”. A lot of discussions and debates have taken place, in favour of and against the concept of CRM, but research has shown in abundance that it is an efficient tool that can save the money of the organization, infuse increased revenue and tries to impart loyalty to the customers. In today's competitive world, organizations need specialized skills and practices in order to have the edge over the competitors to flourish. Customer Relationship Management is an easy to implement and company-specific process through which the organization can try to be a step ahead of the competition. The paper focuses on how customer satisfaction in private banks in Pune area depends on the online customer relationship management of these banks. We have also discussed the development of web infrastructure and increasing efficiency of statistics and surveying techniques made it easier to study the effect of customer relationship management on overall consumer satisfaction. We used R, which is a free software platform for statistical computing and graphical visualization, to study the relationships between factors affecting customer satisfaction. For the purpose of this paper, we have tried to see the impact of the variables age, gender, location of stay, time to banking, synchronization between in-person and online banking and online customer satisfaction rating on the overall rating of the bank.

Literature Review:

Freeland (2003) talks about the importance of the internet to build an efficient customer relationship management process and its utilization in present and future. He also stresses on building the online infrastructure required to handle customer data, which will make it easy for the concerned people to analyze and obtain results from it.

Hamid and Kassim (2004) showed in their research that customer loyalty is a result of both online and offline services. They stressed the importance of the internet and its potential to ease the process of customer relationship management. They also found that companies, till the year 2004, mostly focused on using the internet to provide corporate information to build their brand rather than using it for other strategy and planning, which in some way limits the potential of the infrastructure.

Kennedy (2006) explains the conception and rise of electronic customer relationship management. He describes e-CRM as a double-edged sword, which promises both- a window of opportunities and a door of challenges. It is based on how effectively the process is adopted and implemented. He explores the opportunities created by e-CRM in the sense that it enhances customer interactions and relationships. He also talks about the challenges, which concerns the data infrastructure, integration, privacy and security challenges.

Methodology:

a) Data Collection:

Data is gathered from Pune district residents who have a bank account in at least one private bank. The demographic information contained the name of the bank, age, gender, employment status, residence location, etc. This information was used to analyze the behavioural characteristics of the survey respondents who have chosen a certain answer towards a specific question. The second section of the survey consisted of rating specific bank features on a scale of 1-5, one the lowest and 5 being the highest. The third section had a couple of questions- the first one asking the subject to rate the online customer services and the second one asking the subject to rate the overall services of the bank.

The survey questionnaire was designed with the aim of obtaining almost all required demographic and customer experience data. In this article, we focus on establishing the impact of the following factors - age, gender, synchronization between in-person and online banking and online customer satisfaction rating, on the overall customer rating of the bank services.

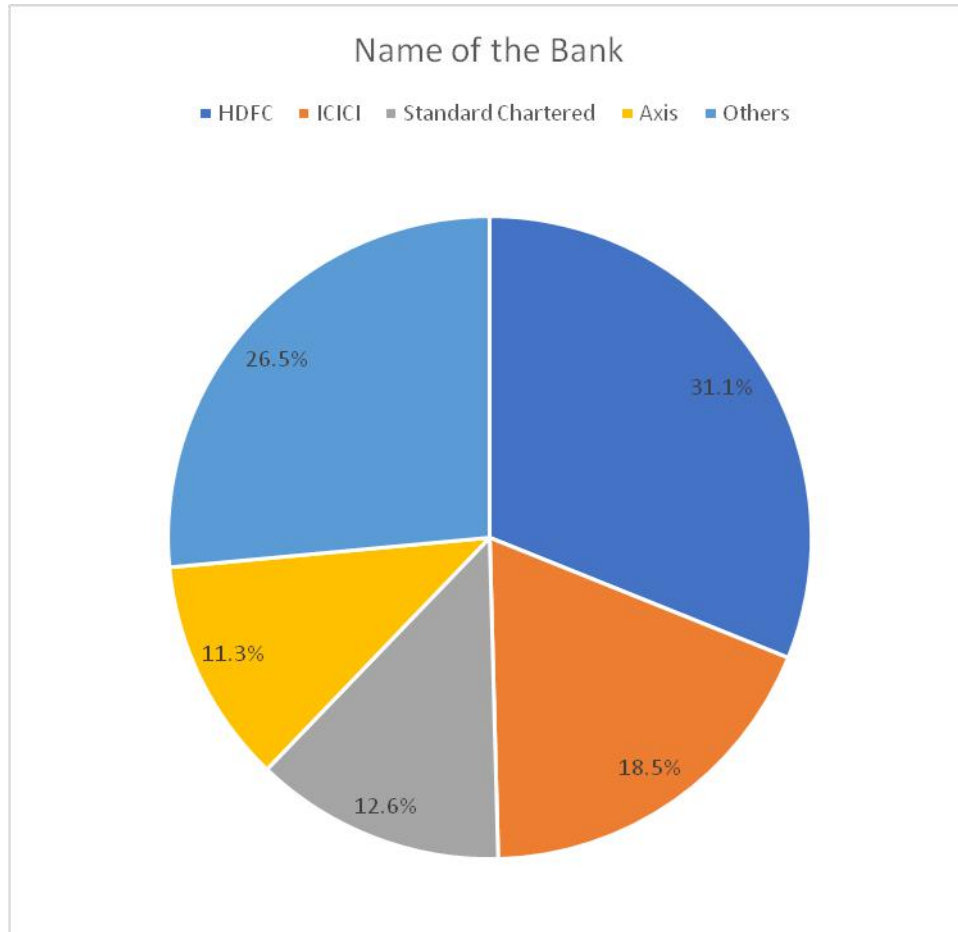
A total of 1157 surveys were completed, and for the purpose of this research article, 300 random observations were selected using `sample()` function in R.

b) Data Analysis:

1) Name of the Bank:

In the questionnaire, we asked the subjects the name of their respective private banks. We have 4 definite choices- HDFC, Axis, ICICI and Standard Chartered banks, and a fifth

“Others” option was given to mention any other banks. Fig.1 shows the pie chart distribution of the responses to this question. Out of the 300 subjects in the sample, 238 answered the name of their respective banks. The number of HDFC Bank customers was the highest- 31.1%, followed by ICICI Bank (18.5%), Standard Chartered (12.6%) and Axis Bank (11.3%) customers. These four banks represent over 70% of the total sample.

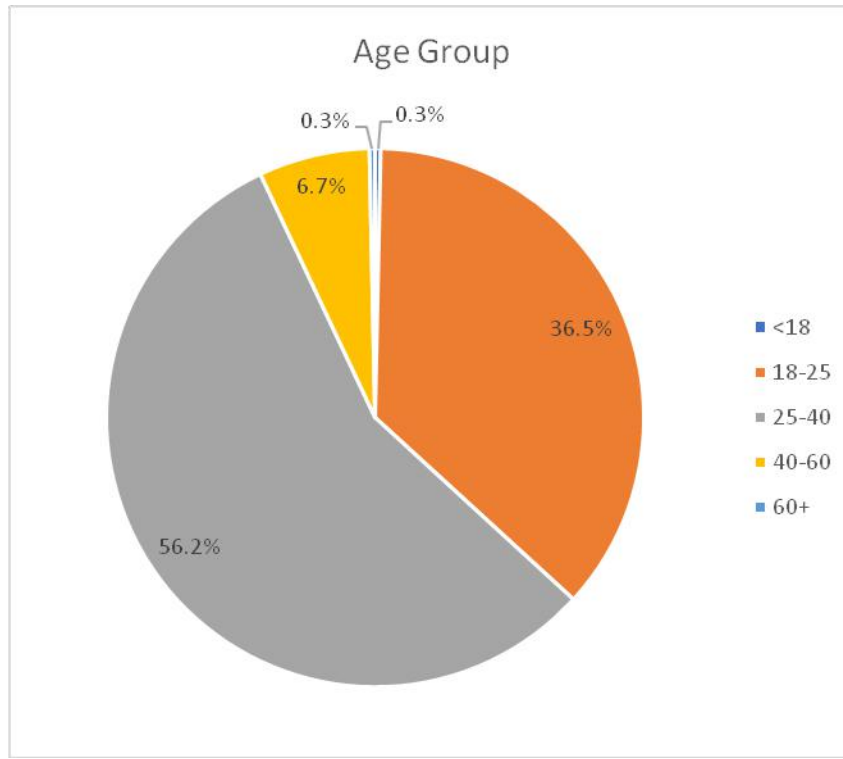


2) Age:

The age variable was divided into five distinct groups. Less than 18 years represented the school going population, who may require assistance for accessing and understanding the banking services. The most critical age groups for our study were between 18-25 years and 25-40 years, who have seen the growth of online customer relationship management very closely. These age groups represent the college students and working class, middle-aged samples, who by virtue of digitalization of banking, come across the online banking services more often than others, and are also frequent users of internet banking and mobile applications.

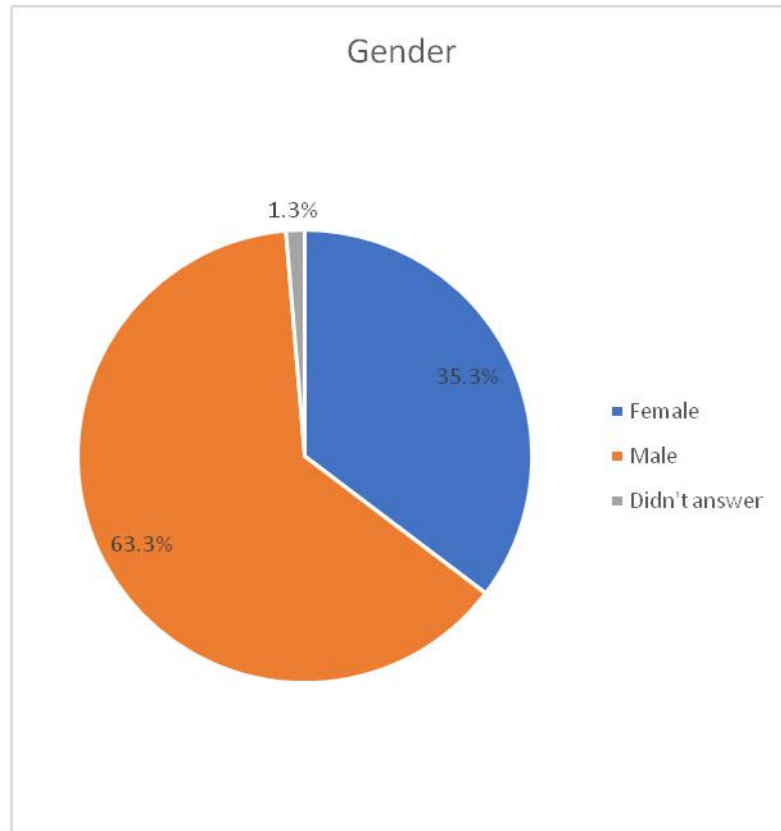
Most of the respondents were from the age group 25-40 years, which represented 56.2%. Next was the age group 18-25, which represented 36.5%. Hence, more than 90% of the

sample size belonged to the group which frequents the use of the internet and mobile banking.



3) Gender:

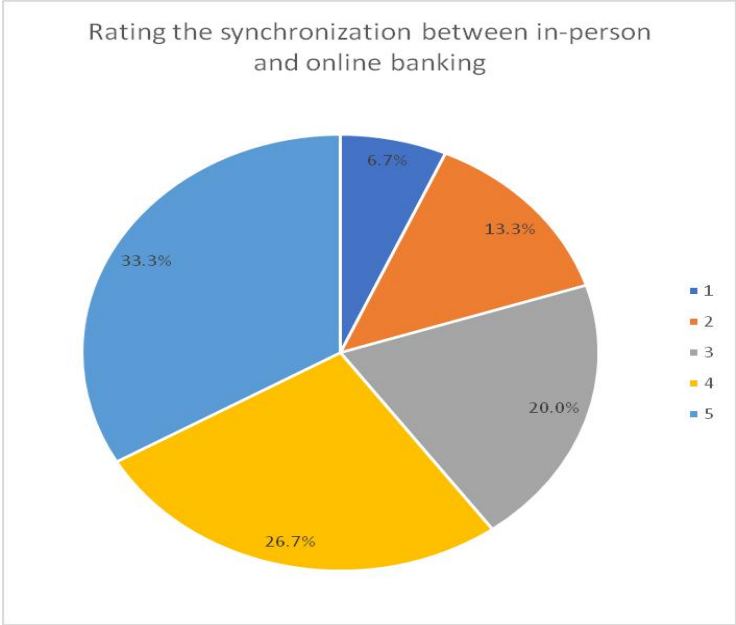
Gender as a variable was represented by Males (63.3%), Females (35.3%) and 1.3% respondents said they prefer not to disclose their gender. The sample was skewed towards male counterparts which are representative of the general statistics in the country, as mentioned by Financial Express (2018).



4) Synchronization between in-person and online banking services:

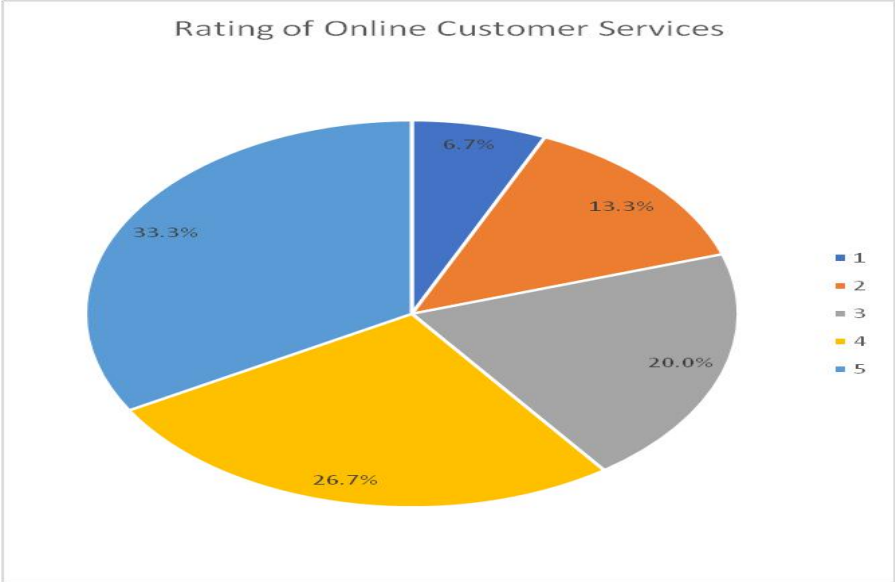
Based on previous studies and generally perceived logic, we decided to put a question for survey respondents to rate what they perceive is the quality of synchronization between their in-person and online banking. For example, when they deposit money in the bank, how quickly can they see it in their online or mobile applications? How quick is the OTP (One-Time-Password) service, etc.? We hypothesize that better and efficient synchronization between in-person and online banking services will lead to a better overall rating for the bank.

20% of the sample survey respondents gave a poor (1 or 2) rating to the synchronization process, whereas more than 45% gave it a rating of 3 or 4. 33.3% respondents gave a rating of 5, which is an indication of the significant improvement that is underway in the banking technology sector.



5) Rating for Online customer services:

This question was designed to get a prior determinant of customer satisfaction on online services. This is the most critical variable of interest, as we aim to correlate it directly with the overall customer satisfaction. As established earlier, the maximum respondents in our survey were between the age group 18-40 years and consisted primarily of employed people and students. 80% of respondents gave a rating between 3-5, which is a good observation. The observations conclude that most samples are satisfied with the quality of online customer services in their respective banks.



c) Fitting Linear Models to analyze the impact of the above factors on overall customer satisfaction:

Let us assume the following notations for our response and predictors:

- Overall Customer Satisfaction- Y
- Age- X₁
- Gender- X₂
- Rating for Synchronization between in-person and online banking – X₃
- Rating for online customer services- X₄

A linear model is of form- $Y = \beta_0 + \beta_i X_i$

β_0 is the intercept, and β_i are the coefficients of predictors X_i . Our current model can be represented using the notations we defined above-

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

1) Full Model:

In this model, we model the response overall customer satisfaction against age, gender, synchronization between online customer satisfaction rating to understand the effects of these factors in the presence of each other.

Hypothesis:

For the full model, we see the following model-

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

Null Hypothesis H₀: None of the X_i affects the response Y, i.e. all β_i are equal to 0.

Alternative Hypothesis H_A: At least one of the factors affects the response, i.e. at least one β_i is not equal to zero.

Regression is done with significance level $\alpha = 0.05$.

A p-value of < 0.05 (95% significance level) in Simple Linear Regression parameter estimate will give sufficient support for rejecting the null hypothesis.

```
Call:
lm(formula = R2 ~ factor(R1) + factor(P1) + Age + Gender, data = data1)

Residuals:
    Min     1Q   Median     3Q     Max
-2.20315 -0.32616  0.09707  0.31720  2.16189

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    2.76348    0.68277   4.047 6.72e-05 ***
factor(R1)2    -0.07421    0.25534  -0.291 0.77157
factor(R1)3     0.51882    0.23268   2.230 0.02656 *
factor(R1)4     0.99847    0.23638   4.224 3.26e-05 ***
factor(R1)5     1.79910    0.25348   7.098 1.06e-11 ***
factor(P1)2     0.79311    0.29011   2.734 0.00666 **
factor(P1)3     1.34353    0.27662   4.857 1.99e-06 ***
factor(P1)4     1.55009    0.28150   5.507 8.33e-08 ***
```

factor(P1)5	1.56366	0.28585	5.470	1.00e-07	***
Age>60 years	-1.00000	0.88294	-1.133	0.25837	
Age18-25 years	-1.31720	0.63186	-2.085	0.03802	*
Age25-40 years	-1.40073	0.63132	-2.219	0.02731	*
Age40-60 years	-1.41483	0.64491	-2.194	0.02907	*
GenderMale	-0.10549	0.08028	-1.314	0.18992	
GenderPrefer not to say	0.24044	0.37047	0.649	0.51687	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Residual standard error: 0.6243 on 278 degrees of freedom (7 observations deleted due to missingness)					
Multiple R-squared: 0.5604, Adjusted R-squared: 0.5382					
F-statistic: 25.31 on 14 and 278 DF, p-value: < 2.2e-16					

We can see that except Gender, all other predictors are significant at 95% level. We can conclude that in a model consisting of all the parameters, age group, synchronization of in-person and online banking services and an overall ranking for online services are the significant predictors of the overall rating.

2) Model Y ~ X1

In this model, we model the response overall customer satisfaction against age.

Hypothesis:

For this model, we see the following form-

$$Y = \beta_0 + \beta_1 X_1$$

Null Hypothesis H₀: Age has no effect on overall customer satisfaction.

$$\text{Mathematically, } \beta_1 = 0$$

Alternative Hypothesis H_A: Age has a significant effect on overall customer satisfaction.

$$\text{Mathematically, } \beta_1 \neq 0$$

Regression is done with significance level alpha=0.05.

A p-value of <0.05 (95% significance level) in Simple Linear Regression parameter estimate will give sufficient support for rejecting the null hypothesis.

```
> lmod1 <- lm (R2 ~ Age, data1)
> summary(lmod1)

Call:
lm(formula = R2 ~ Age, data = data1)

Residuals:
   Min    1Q  Median    3Q   Max
-2.5854 -0.5854  0.4146  0.4167  1.4167
```


Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	5.0000	0.9193	5.439	1.14e-07 ***
Age>60 years	-1.0000	1.3001	-0.769	0.442
Age18-25 years	-1.4167	0.9236	-1.534	0.126
Age25-40 years	-1.4146	0.9221	-1.534	0.126
Age40-60 years	-1.3000	0.9420	-1.380	0.169

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9193 on 289 degrees of freedom

(6 observations deleted due to missingness)

Multiple R-squared: 0.009668, Adjusted R-squared: -0.004039

F-statistic: 0.7054 on 4 and 289 DF, p-value: 0.5888

We can see that none of the p-values are lesser than the $\alpha=0.05$. Hence, we can conclude that individually, age is not a significant factor to determine the overall customer satisfaction in private banks. The coefficient values of the age groups are negative because the model gives the absolute response values, which are between 1-5. The ages values, as we have seen, are mostly between 18-40 years. Hence, the coefficients are negative. Interpretation of coefficient is easy. The coefficient of Age 18-25 years is -1.4167. Hence, the mean value of overall customer satisfaction rating will be the sum of the intercept and the coefficient, i.e. $5 - 1.4167 = 3.5833$. Hence, the mean overall customer satisfaction rating for the age group 18-25 years is 3.5833, which is a high rating.

3) Model $Y \sim X_2$

In this model, we model the response overall customer satisfaction against gender.

Hypothesis:

For this model, we see the following form-

$$Y = \beta_0 + \beta_2 X_2$$

Null Hypothesis H_0 : Employment status has no effect on overall customer satisfaction.

Mathematically, $\beta_2 = 0$

Alternative Hypothesis H_A : Employment status has a significant effect on overall customer satisfaction.

Mathematically, $\beta_2 \neq 0$

Regression is done with significance level $\alpha=0.05$.

A p-value of <0.05 (95% significance level) in Simple Linear Regression parameter estimate will give sufficient support for rejecting the null hypothesis.

```
> lmod2 <- lm (R2 ~ Gender, data1)
> summary(lmod2)
```

```

Call:
lm(formula = R2 ~ Gender, data = data1)
Residuals:
  Min    1Q  Median    3Q   Max
-2.6108 -0.6108  0.3892  0.4245  1.4245

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    3.57547   0.08940  39.993 <2e-16 ***
GenderMale      0.03534   0.11213   0.315  0.753
GenderPrefer not to say 0.09119   0.53889   0.169  0.866
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9204 on 291 degrees of freedom
(6 observations deleted due to missingness)
Multiple R-squared:  0.0003981,    Adjusted R-squared:  -0.006472
F-statistic: 0.05794 on 2 and 291 DF,  p-value: 0.9437

```

We can see that none of the p-values is lesser than the alpha=0.05. Hence, we can conclude that individually, gender is also not a significant factor to determine the overall customer satisfaction in private banks. Here, the Females are taken as the baseline, i.e. the mean overall customer satisfaction rating is the value of the intercept, i.e. 3.57. Ratings for other employment groups can be derived from adding their coefficients to the intercept value.

4) Model Y ~ X3

In this model, we model the response overall customer satisfaction against synchronization of in-person and online services.

Hypothesis:

For this model, we see the following form-

$$Y = \beta_0 + \beta_3 X_3$$

Null Hypothesis H₀: Online customer satisfaction has no effect on overall customer satisfaction.
Mathematically, $\beta_3 = 0$

Alternative Hypothesis H_A: Online customer satisfaction has a significant effect on overall customer satisfaction.
Mathematically, $\beta_3 \neq 0$

Regression is done with significance level alpha=0.05.

A p-value of <0.05 (95% significance level) in Simple Linear Regression parameter estimate will give sufficient support for rejecting the null hypothesis.

```

> lmod3 <- lm (R2 ~ factor(P1), data1)
> summary(lmod3)

Call:
lm(formula = R2 ~ factor(P1), data = data1)

Residuals:
    Min     1Q   Median     3Q      Max
-2.3778 -0.3778  0.1339  0.6222  1.6222

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.5714    0.2896   5.425 1.23e-07 ***
factor(P1)2  0.8175    0.3413   2.395  0.0173 *
factor(P1)3  1.8063    0.3007   6.007 5.68e-09 ***
factor(P1)4  2.2946    0.2986   7.686 2.41e-13 ***
factor(P1)5  2.4134    0.3046   7.923 5.10e-14 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.7663 on 288 degrees of freedom
(7 observations deleted due to missingness)
Multiple R-squared:  0.3138,    Adjusted R-squared:  0.3043
F-statistic: 32.93 on 4 and 288 DF, p-value: < 2.2e-16

```

As we saw in the full model, the synchronization of in-person and online services is significant at 95% significance level. A person rating the synchronization as five will rate the overall customer satisfaction as 3.98 ~ 4 on an average, which shows a fair correlation between the values.

5) Model Y ~ X4

In this model, we model the response overall customer satisfaction against customer satisfaction with online services.

Hypothesis:

For this model, we see the following form-

$$Y = \beta_0 + \beta_4 X_4$$

Null Hypothesis H₀: Online customer satisfaction has no effect on overall customer satisfaction.
Mathematically, $\beta_4 = 0$

Alternative Hypothesis H_A: Online customer satisfaction has a significant effect on overall customer satisfaction.

Mathematically, $\beta_4 \neq 0$

Regression is done with significance level $\alpha=0.05$.

A p-value of <0.05 (95% significance level) in Simple Linear Regression parameter estimate will give sufficient support for rejecting the null hypothesis.

```
> lmod4 <- lm (R2 ~ factor(R1), data1)
> summary(lmod4)

Call:
lm(formula = R2 ~ factor(R1), data = data1)

Residuals:
    Min     1Q   Median     3Q      Max
-2.8049 -0.2474  0.1951  0.3409  2.5556

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.0000     0.2008   9.961 < 2e-16 ***
factor(R1)2  0.4444     0.2548   1.744  0.0822 .
factor(R1)3  1.2474     0.2119   5.888 1.09e-08 ***
factor(R1)4  1.8049     0.2096   8.612 4.77e-16 ***
factor(R1)5  2.6591     0.2245  11.846 < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6659 on 288 degrees of freedom
(7 observations deleted due to missingness)
Multiple R-squared:  0.4819,    Adjusted R-squared:  0.4747
F-statistic: 66.96 on 4 and 288 DF, p-value: < 2.2e-16
```

The sample population which gave a high rating to the bank's online customer service is significant at 95% significance level. A person rating the online customer services as 5 will rate the overall customer satisfaction as 4.6591 on an average, which shows a fair correlation between the values.

Conclusion

The primary aim of the article was to see if any of the factors- age, gender, synchronization of in-person and online services and customer satisfaction with online services is a strong predictor of the overall customer satisfaction. From our analysis, we have found that age, synchronization of in-person and online services and customer satisfaction with online services is significant. Gender does not affect the customer satisfaction rating, which implies that private banks in Pune district have made their policies and schemes acceptable across gender. There is a notion that only the young population understands and appreciates the ease and accessibility of online customer relationship management services, and we were able to validate those trends at some

level. The main limitation of our study is that we were not able to collect the data from a large population, but it was due to the selective condition on the sample selection. In future, we would work to improve on it and make the research more generalized and established over a large population sample.

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