

HRA CHEF REHIRING ASSIGNMENT

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07-12-2020

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1 CASE ANALYSIS

1.1 Case Summary



Bella's Bistro, a French restaurant chain which is popular for its Italian dishes has branches in all major Indian cities. Capo Moi, an Italian restaurant acquired Bella's Bistro, but divested it after two years. In the meantime, there was attrition of some of the original employees of Bella's Bistro who were unable to accommodate to the new culture at Capo Moi. When Bella's Bistro restarted functioning independently, they encountered staff shortage. Bella's Bistro is interested in rehiring the old employees who had left them as part of Capo Moi. It sent out a countrywide campaign and received about 300 application from old chefs. There was an initial telephonic interview round and about one third ex-employees among the 300 were invited for a second round of interview and some of them were offered.

1.2 Decision Scenario

On the basis of the interview and offer, so as to optimize the selection costs, Bella's Bistro decided to call only those ex-employees who stand a chance of being rehired. Accordingly, the HR team wants to know who among the remaining old chefs' applicants should be called for interview. It is proposed to develop a predictive model to anticipate the chance of rehiring an ex-employee.

1.3 Tools for Data Analysis

Jamovi (1.2.27 Solid Version) and Rstudio (Version 1.3.1093) are the open-source software used for data analysis.

1.4 Dataset

The HR department has compiled the selection data of about 86 interviews. The variables are as shown in the table below,

Table 1: Variables

Sl.No	Variable Name	Variable type	Variable description
1	Candidate ID	ID	Unique identification number provided to each ex-chef who applied for the position of Italian chef at Bella's Bistro.
2	Gender	Nominal (Categorical)	Gender of the candidate (Male/Female)
3	Education	Nominal	Qualification of the applicants (Diploma/ Bachelors)
4	Experience	Continuous	The total relevant experience in a similar profile
5	BB Tenure	Continuous	The previous tenure of the chef with Bella's Bistro
6	Performance Rating	Continuous	The last available performance rating while the employee was with Bella's Bistro (1-5 scale)
7	Reason	Nominal	The reason why the employee left the organization
8	Awards	Nominal	Whether the employee has received an award during their previous tenure with Bella's Bistro or not
9	Rating from CV	Continuous	An initial rating of their skills and abilities obtained from their CV (1-10 scale,1 being highest)
10	HR Interview Rating	Continuous	The rating of the employee given after the initial round of interview with HR(1-10 scale,1 being highest)
11	Worked for Competitor	Nominal	Whether the employee had worked for a competitor restaurant or not
12	Special Skills	Nominal	Whether the ex-employee is an expert in Gougere or Lasagna
13	Rehire	Nominal	Whether the ex-employee was rehired or not

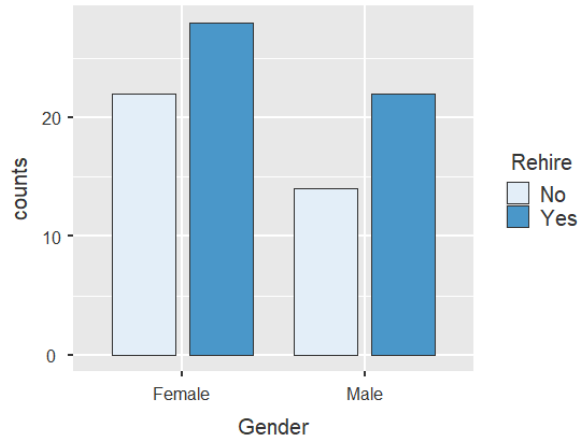
The data descriptive showing the continuous variables split by nominal variable Rehire is as follows,

Table 2: Descriptive Statistics

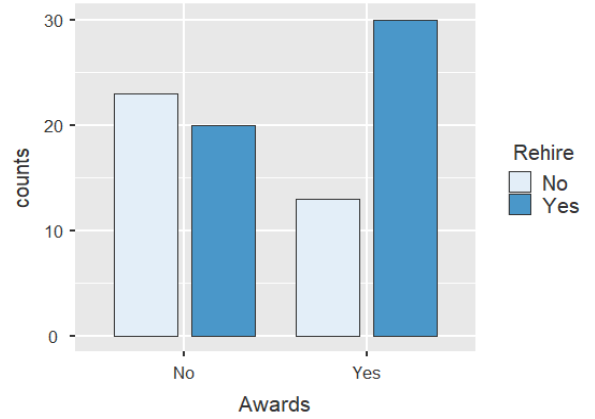
Descriptive						
	Rehire	Experience	BB Tenure	Performance Rating	Rating from CV	HR Interview Rating
N	No	36	36	36	36	36
	Yes	50	50	50	50	50
Missing	No	0	0	0	0	0
	Yes	0	0	0	0	0
Mean	No	5.14	2.97	2.67	5.92	5.31
	Yes	5.26	3.08	3.62	5.66	5.28
Median	No	5.00	3.00	2.00	6.00	5.00
	Yes	5.00	3.00	4.00	5.50	5.00
Minimum	No	2	1	1	2	2
	Yes	2	1	2	2	2
Maximum	No	8	5	5	9	9
	Yes	8	5	5	9	9

Figure 1: Descriptive Plots

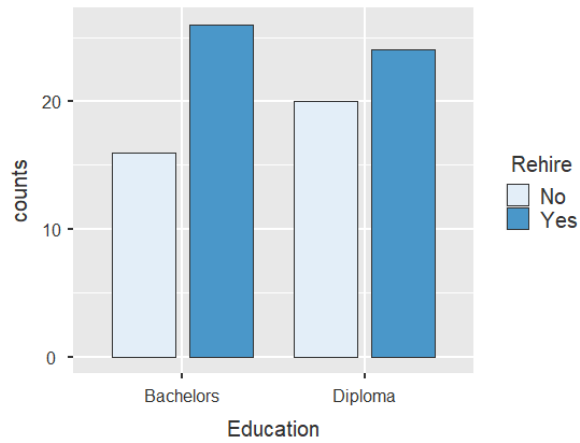
Gender



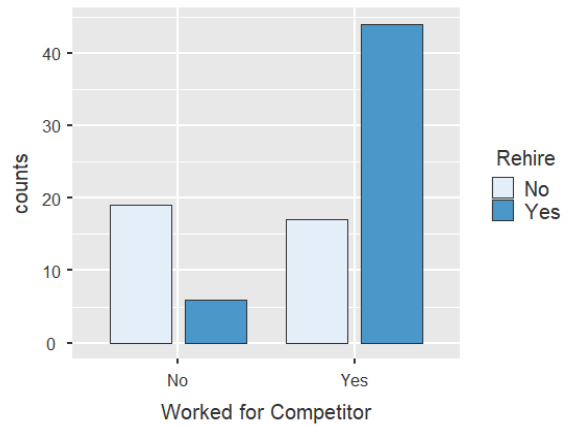
Awards



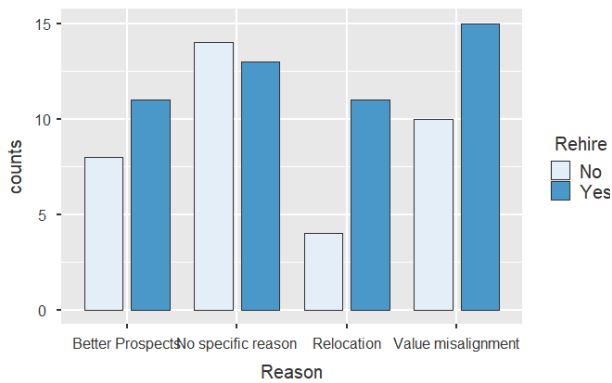
Education



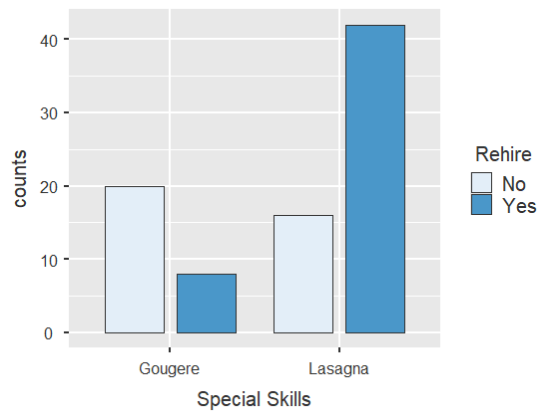
Worked for Competitor



Reason



Special Skills



2 ANALYSIS

2.1 Binomial Logistic Regression Model

$$\text{Log (yes/1 - yes)} = a + b_1(x_1) + \dots + b_n(x_n)$$

2.2 Generic/Full Model

$$\begin{aligned} \text{Chance of Rehire} = & a + b_1(\text{Gender}) + b_2(\text{Education}) + b_3(\text{Experience}) + \\ & b_4(\text{BB Tenure}) + b_5(\text{Performance Rating}) + b_6(\text{Reason}) + b_7(\text{Awards}) + \\ & b_8(\text{Rating from CV}) + b_9(\text{HR Interview Rating}) + b_{10}(\text{Worked for Competitor}) + \\ & b_{11}(\text{Special Skills}) \end{aligned}$$

2.2.1 Binomial Logistic Regression: Generic model

Table 3: Generic Model Fit Measures

Model Fit Measures					
Model	Deviance	AIC	R ² _{McF}	R ² _{CS}	R ² _N
1	55.4	83.4	0.526	0.511	0.687

From Table 3, it can be observed that the AIC (Akaike information criterion) value is 83.4. A lower AIC value indicates a better fit. The pseudo-R² values, i.e., McFadden's R² is 0.526, Cox and Snell's R² is 0.511, Nagelkerke's R² is 0.687.

From Table 4, it can be observed that p value at 95% confidence level is significant for 4 variables, namely, Performance Rating, HR Interview Rating, Worked for Competitor and Special Skills. The p values are not significant for the remaining variables. Interpretation of estimate values for the significant variables is as follows,

- The sign of the estimate value for the variable Performance Rating is positive, it indicates that as the performance rating on a scale of 1 to 5 increases, chance of rehire increases.
- The sign of the estimate value for the variable HR Interview Rating is negative, it indicates that as the HR interview rating on a reverse scale of 1 to 10 (meaning 1 being the highest) increases, the chance of rehire decreases. Therefore, the applicant having lesser HR interview rating on a scale of 1 to 10, has a higher chance of rehire.

- The sign of the estimate value for the variable Worked for Competitor is positive and the reference level is no, it indicates that compared to those who did not work for competitor, those applicants who worked for competitor have more chance of rehire.
- The sign of the estimate value for the variable Special Skills is positive and the reference level is Gougere, it indicates that compared to those who have special skills in preparing Gougere, those applicants who have special skills in preparing Lasagna have higher chance of rehire.

A reduced model can be made for prediction with the significant variables.

Table 4: Generic Model Coefficients

Model Coefficients - Rehire				
Predictor	Estimate	SE	Z	p
Intercept	-9.7742	3.502	-2.7913	0.005
Experience	0.3204	0.217	1.4797	0.139
BB Tenure	0.1092	0.259	0.4211	0.674
Performance Rating	1.4136	0.433	3.2656	0.001
Rating from CV	0.2108	0.175	1.2052	0.228
HR Interview Rating	-0.6380	0.288	-2.2159	0.027
Gender:				
Male – Female	0.5866	0.813	0.7212	0.471
Education:				
Diploma – Bachelors	-0.0250	0.808	-0.0309	0.975
Reason:				
No specific reason – Better Prospects	-0.6662	1.077	-0.6187	0.536
Relocation – Better Prospects	-0.8152	1.450	-0.5624	0.574
Value misalignment – Better Prospects	1.2382	1.087	1.1389	0.255
Awards:				
Yes – No	1.0076	0.744	1.3538	0.176
Worked for Competitor:				
Yes – No	2.8567	0.936	3.0516	0.002
Special Skills:				
Lasagna – Gougere	4.8624	1.576	3.0852	0.002

Note. Estimates represent the log odds of "Rehire = Yes" vs. "Rehire = No"

2.3 Reduced/Working Model

Chance of Rehire = $a + b_1(\text{Performance Rating}) + b_2(\text{HR Interview Rating}) + b_3(\text{Worked for Competitor}) + b_4(\text{Special Skills})$

$\therefore \text{Log}(\text{yes}/1 - \text{yes}) = -4.636 + 1.143(\text{Performance Rating}) - 0.501(\text{HR Interview Rating}) + 2.448(\text{Worked for Competitor}) + 3.732(\text{Special Skills})$

2.4 Model Comparison

Table 5: Model Fit Measures (Model 1&2)

Model Fit Measures					
Model	Deviance	AIC	R^2_{McF}	R^2_{CS}	R^2_{N}
1	63.9	73.9	0.454	0.460	0.619
2	55.4	83.4	0.526	0.511	0.687

In Table 5, Model 1 represents the reduced/working model and Model 2 represents the generic/full model. It can be observed that the AIC (Akaike information criterion) value is 73.9 for Model 1. The AIC value obtained for the reduced model is lower than that of the generic model. A lower AIC value indicates a better fit. The pseudo- R^2 values. McFadden's R^2 is 0.454, Cox and Snell's R^2 is 0.460, Nagelkerke's R^2 is 0.619. The Nagelkerke's R^2 value for Model 1 is only slightly less than the value of Model 2, hence, the reduced model with 4 variables holds good for prediction.

Table 6: Model Comparison

Model Comparisons					
Comparison					
Model	Model	χ^2	df	p	
1	- 2	8.47	9	0.488	

The Table 6 compares the Model 1 and Model 2. The p value indicates that the difference between the two model is not significant. Therefore, the Model 2 with 4 variables is good enough for prediction of rehire.

2.4.1 Model Specific Results

The model specific results are presented below.

2.4.1.1 Model 1 (Reduced/Working Model)

i. Model Coefficients

Table 7: Reduced Model Coefficients

Model Coefficients - Rehire				
Predictor	Estimate	SE	Z	p
Intercept	-4.636	1.601	-2.90	0.004
Performance Rating	1.143	0.345	3.31	< .001
HR Interview Rating	-0.501	0.225	-2.22	0.026
Worked for Competitor:				
Yes – No	2.448	0.727	3.37	< .001
Special Skills:				
Lasagna – Gougere	3.732	1.158	3.22	0.001

Note. Estimates represent the log odds of "Rehire = Yes" vs. "Rehire = No"

The estimate values of the intercept and variables of Table 7 are substituted in the reduced working model.

ii. Assumption Check

Table 8: Collinearity Assumption Check (Working Model)

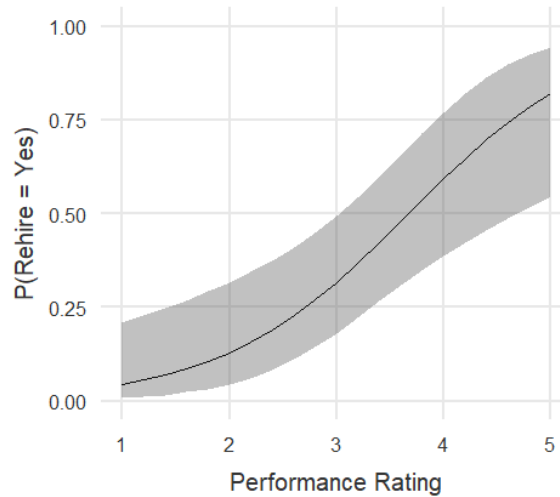
Collinearity Statistics		
	VIF	Tolerance
Performance Rating	1.15	0.868
HR Interview Rating	3.03	0.330
Worked for Competitor	1.13	0.885
Special Skills	3.15	0.317

From Table 8, it can be observed that the VIF (Variance Inflation Factor) is above 3 for two variables, i.e., HR Interview Rating and Special Skills. It can be inferred that the two variables seem to be very much influencing the other factors. Ideally, Tolerance should be less than 1 and VIF value less than 3.

iii. *Estimated Marginal Means Plot*

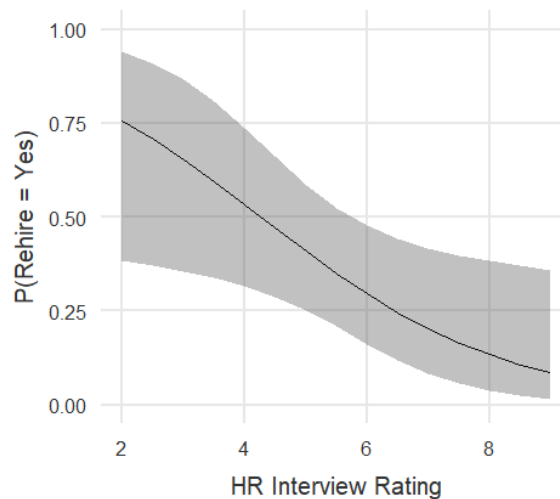
The estimated marginal means plots are as follows.

Figure 2: Estimated Marginal Means (Performance Rating-Rehire)



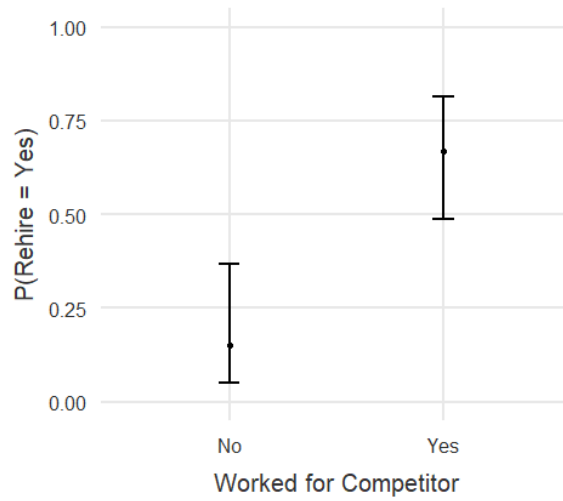
From the Figure 2, it can be inferred that as the performance rating on a scale of 1 to 5 increases, the chance for rehire increases.

Figure 3: Estimated Marginal Means (HR Interview Rating-Rehire)



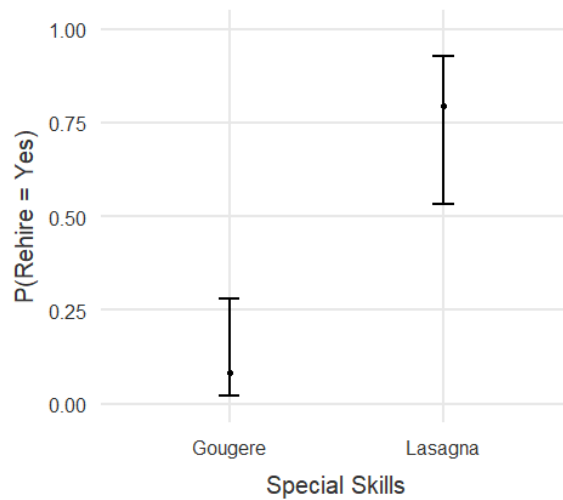
From the Figure 3, It can be inferred that as the HR interview rating on a reverse scale of 1 to 10 (meaning 1 being the highest) increases, the chance of rehire decreases.

Figure 4: Estimated Marginal Means (Worked for Competitor-Rehire)



From the Figure 4, It can be inferred that compared to those who did not work for competitor, those applicants who worked for competitor have more chance of rehire because the median value is higher.

Figure 5: Estimated Marginal Means (Special Skills-Rehire)



From the Figure 5, It can be inferred that compared to those who have special skills in preparing Gougere, those applicants who have special skills in preparing Lasagna have better chance of rehire because the median value is higher.

iv. *Prediction*

Table 9: Confusion Matrix (Working Model)

Classification Table – Rehire			
Observed	Predicted		% Correct
	No	Yes	
No	29	7	80.6
Yes	7	43	86.0

Note. The cut-off value is set to 0.5

The observed or actual outcome of rehire and predicted outcome of rehire using the working model is presented in Table 9. The correctness percentage of predicted instances of no rehire is 80.6%, this is the specificity. The correctness percentage of predicted instances of rehire is 86.0%, this is the sensitivity.

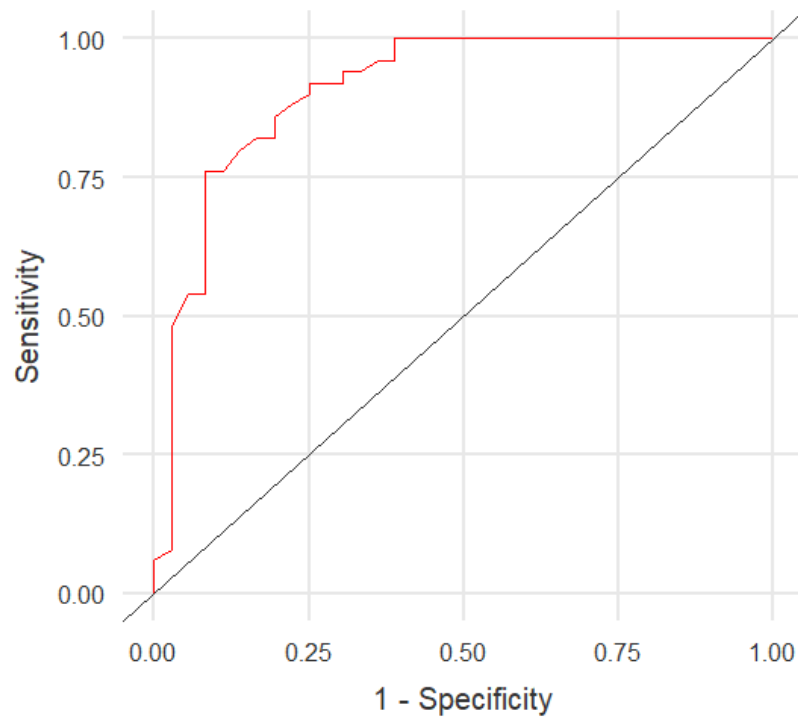
Table 10: Predictive Measures of Working Model

Predictive Measures			
Accuracy	Specificity	Sensitivity	AUC
0.837	0.806	0.860	0.909

Note. The cut-off value is set to 0.5

Sensitivity measures the proportion of true positives that are correctly identified, i.e., 0.860 and Specificity measures the proportion of true negatives, i.e., 0.806. The Accuracy of the working model is 0.837. This means that given the information on 4 significant variables, this model can predict with 83.7% accuracy whether the applicant will be rehired or not. The AUC (Area Under the Curve) value is 0.909. The higher the AUC i.e., close to 1, the better the performance of the model.

Figure 6: ROC Curve (Working Model)



The ROC (Receiver Operating Characteristic) curve shows the relationship between sensitivity and 1-specificity for possible cut-off.

2.4.1.2 Model 2 (Generic/Full Model)

The model coefficients of the Generic Model are represented already in Table 4. The interaction effects are not considered in the model builder.

i. Assumption Check

Table 11: Collinearity Assumption Check (Generic Model)

Collinearity Statistics		
	VIF	Tolerance
Performance Rating	1.25	0.802
HR Interview Rating	2.08	0.480
Worked for Competitor	1.24	0.810
Special Skills	2.22	0.451
Experience	1.23	0.815
BB Tenure	1.21	0.829
Rating from CV	1.16	0.862
Gender	1.16	0.863
Education	1.20	0.835
Reason	1.16	0.863
Awards	1.10	0.907

From Table 11, it can be observed that the VIF (Variance Inflation Factor) value is less than 3 and tolerance values is less than 1 for all variables.

ii. Prediction

Table 12: Confusion Matrix (Generic Model)

Classification Table – Rehire			
Observed	Predicted		% Correct
	No	Yes	
No	27	9	75.0
Yes	5	45	90.0

Note. The cut-off value is set to 0.5

The observed or actual outcome of rehire and predicted outcome of rehire using the generic model is presented in Table 12. The correctness percentage of predicted

instances of no rehire is 75.0%, this is the specificity. The correctness percentage of predicted instances of rehire is 90.0%, this is the sensitivity.

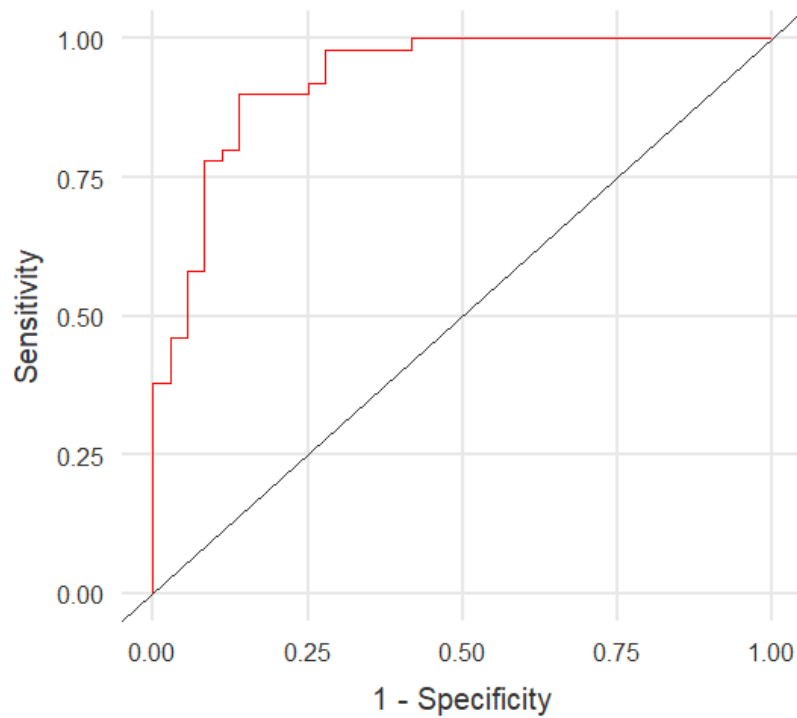
Table 13: Predictive Measures of Generic Model

Predictive Measures			
Accuracy	Specificity	Sensitivity	AUC
0.837	0.750	0.900	0.928

Note. The cut-off value is set to 0.5

Sensitivity of the generic model is 0.900 and Specificity is 0.750. Compared to the Working model, the specificity is lower and sensitivity is higher in the generic model. The Accuracy is 0.837. The AUC value is 0.928.

Figure 7: ROC Curve (Generic Model)



The ROC (Receiver Operating Characteristic) curve shows the relationship between sensitivity and 1-specificity for possible cut-off.

3 CONCLUSION AND RECOMMENDATIONS

Based on the interview and offers made previously, to optimize the selection costs Bella's Bistro may call only those ex-employees who stand a chance of being rehired. For this a prediction model using Binomial Logistic Regression is developed with 4 significant variables.

$$\text{Rehire (yes/no)} = a + b_1(\text{Performance Rating}) + b_2(\text{HR Interview Rating}) + b_3(\text{Worked for Competitor}) + b_4(\text{Special Skills})$$

The prediction model is represented mathematically as,

$$\therefore \text{Log (yes/1 - yes)} = -4.636 + 1.143(\text{Performance Rating}) - 0.501(\text{HR Interview Rating}) + 2.448(\text{Worked for Competitor}) + 3.732(\text{Special Skills})$$

It is recommended to the HR team to call those applicants with high Performance Rating (on a scale of 1-5, 5 being highest), low HR Interview Rating (on scale of 1 to 10, because 1 being highest on reverse scale), who have worked for competitors and who have special skills in preparing lasagna from the remaining old chefs' applications.

The analysis is conducted with the selection data of about 86 interviews. With more sample size, the accuracy of the prediction model can be improved.

Organizational cultural shock during the time of acquisition may be a reason of attrition. In such events HR teams could plan some orientation, engagement activities so that employees could accommodate to the new culture.

4 APPENDIX

chef-rehiring.R

Reshma Sattar

2020-12-07

```
library(pscl)

library(car)

#Loading data in Rstudio
Welcome.aboard.again <- read.csv("~/HR R studio/Welcome aboard again.csv")
View(Welcome.aboard.again)
#Get Summary of data
summary(Welcome.aboard.again)

## Candidate.ID          Gender          Education          Experience
## Length:86            Length:86            Length:86            Min.    :2.000
## Class :character      Class :character      Class :character      1st Qu.:4.000
## Mode  :character      Mode  :character      Mode  :character      Median :5.000
##                                     Mean    :5.209
##                                     3rd Qu.:7.000
##                                     Max.    :8.000
## BB.Tenure             Performance.Rating     Reason              Awards
## Min.    :1.000         Min.    :1.000         Length:86           Length:86
## 1st Qu.:2.000         1st Qu.:2.250         Class :character     Class :character
## Median :3.000         Median :3.000         Mode  :character     Mode  :character
## Mean    :3.035         Mean    :3.221
## 3rd Qu.:4.000         3rd Qu.:4.000
## Max.    :5.000         Max.    :5.000
## Rating.from.CV        HR.Interview.Rating   Worked.for.Competitor Special.Skills
## Min.    :2.000         Min.    :2.000         Length:86           Length :86
## 1st Qu.:4.000         1st Qu.:3.000         Class :character     Class :character
## Median :6.000         Median :5.000         Mode  :character     Mode  :character
## Mean    :5.767         Mean    :5.291
## 3rd Qu.:8.000         3rd Qu.:7.000
## Max.    :9.000         Max.    :9.000
## Rehire
## Length:86
## Class :character
## Mode  :character
```

#Make Dependent Variable as factor with 2 Levels

```
Welcome.aboard.again$Rehire <- as.factor(Welcome.aboard.again$Rehire)
str(Welcome.aboard.again)
```

```
## 'data.frame':    86 obs. of  13 variables:
## $ Candidate.ID      : chr  "R405" "R335" "R450" "R410" ...
## $ Gender            : chr  "Female" "Female" "Male" "Female" ...
## $ Education          : chr  "Diploma" "Bachelors" "Diploma" "Bachelors" .
..
## $ Experience         : int   8 7 5 5 6 8 6 4 7 5 ...
## $ BB.Tenure         : int   5 3 5 5 4 5 1 1 4 5 ...
## $ Performance.Rating : int   3 4 5 2 3 3 4 4 2 5 ...
## $ Reason            : chr   "Relocation" "Relocation" "Value misalignment
" "No specific reason" ...
## $ Awards            : chr   "No" "No" "Yes" "No" ...
## $ Rating.from.CV     : int   9 6 5 9 3 6 7 8 8 7 ...
## $ HR.Interview.Rating : int   3 4 7 5 2 6 4 9 7 5 ...
## $ Worked.for.Competitor: chr   "Yes" "No" "Yes" "Yes" ...
## $ Special.Skills     : chr   "Gougere" "Gougere" "Lasagna" "Gougere" ...
## $ Rehire            : Factor w/ 2 levels "no","yes": 2 1 2 1 2 1 2 2 2 2
...
```

Generic Model

```
GenericModel <- glm(Rehire~Gender+Education+Experience+BB.Tenure+Performance.Ra
ting+Reason+Awards+Rating.from.CV+HR.Interview.Rating+Worked.for.Competitor+Spe
cial.Skills,data=Welcome.aboard.again,family="binomial")
summary(GenericModel)
```

```
##
## Call:
## glm(formula = Rehire ~ Gender + Education + Experience + BB.Tenure +
##      Performance.Rating + Reason + Awards + Rating.from.CV + HR.Interview.Rat
ing +
##      Worked.for.Competitor + Special.Skills, family = "binomial",
##      data = Welcome.aboard.again)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.5734   -0.2854    0.0944    0.4786    1.8460
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)   -9.77425     3.50164  -2.791  0.00525 **
## GenderMale      0.58657     0.81336   0.721  0.47080
## EducationDiploma -0.02497     0.80812  -0.031  0.97535
## Experience      0.32035     0.21650   1.480  0.13896
## BB.Tenure       0.10924     0.25941   0.421  0.67369
## Performance.Rating 1.41365     0.43290   3.266  0.00109 **
## ReasonNo specific reason -0.66619     1.07667  -0.619  0.53608
## ReasonRelocation -0.81517     1.44954  -0.562  0.57387
## ReasonValue misalignment 1.23823     1.08717   1.139  0.25473
## AwardsYes       1.00760     0.74425   1.354  0.17579
## Rating.from.CV   0.21079     0.17490   1.205  0.22811
```

```

## HR.Interview.Rating      -0.63798      0.28791  -2.216  0.02670 *
## Worked.for.CompetitorYes  2.85667      0.93614   3.052  0.00228 **
## Special.SkillsLasagna    4.86243      1.57607   3.085  0.00203 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 116.932  on 85  degrees of freedom
## Residual deviance:  55.432  on 72  degrees of freedom
## AIC: 83.432
##
## Number of Fisher Scoring iterations: 6

pscl::pR2(GenericModel)["McFadden"]

## fitting null model for pseudo-r2

## McFadden
## 0.5259446

car::vif(GenericModel)

##
##              GVIF Df GVIF^(1/(2*Df))
## Gender          1.342442  1      1.158638
## Education        1.433145  1      1.197141
## Experience        1.506748  1      1.227497
## BB.Tenure         1.455317  1      1.206365
## Performance.Rating 1.555297  1      1.247115
## Reason            2.426461  3      1.159210
## Awards            1.214671  1      1.102121
## Rating.from.CV     1.344709  1      1.159616
## HR.Interview.Rating 4.335445  1      2.082173
## Worked.for.Competitor 1.525644  1      1.235170
## Special.Skills     4.913436  1      2.216627

#Reduced Model
WorkingModel <- glm(Rehire~Performance.Rating+HR.Interview.Rating+Worked.for.Competitor+Special.Skills,data=Welcome.aboard.again,family="binomial")
summary(WorkingModel)

##
## Call:
## glm(formula = Rehire ~ Performance.Rating + HR.Interview.Rating +
##      Worked.for.Competitor + Special.Skills, family = "binomial",
##      data = Welcome.aboard.again)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.9216  -0.5219   0.1933   0.5115   1.6504
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -4.6363     1.6010  -2.896  0.003780 **
## Performance.Rating  1.1430     0.3454   3.309  0.000937 ***

```

```

## HR.Interview.Rating      -0.5008      0.2254  -2.222 0.026287 *
## Worked.for.CompetitorYes  2.4478      0.7267   3.368 0.000756 ***
## Special.SkillsLasagna    3.7324      1.1576   3.224 0.001263 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 116.932  on 85  degrees of freedom
## Residual deviance:  63.898  on 81  degrees of freedom
## AIC: 73.898
##
## Number of Fisher Scoring iterations: 6

pscl::pR2(WorkingModel)["McFadden"]

## fitting null model for pseudo-r2

## McFadden
## 0.4535455

car::vif(WorkingModel)

##      Performance.Rating      HR.Interview.Rating      Worked.for.Competitor
##              1.151755              3.030625              1.129358
##              Special.Skills
##              3.152659

```

Hypotheses

Chi-square test is performed to test the following hypotheses,

H₀₁: Rehire is independent of Gender

H_{a1}: Rehire is dependent on Gender

H₀₂: Rehire is independent of Education

H_{a2}: Rehire is dependent on Education

H₀₃: Rehire is independent of Award

H_{a3}: Rehire is dependent on Award

Table 14: Contingency Table for Hypothesis 1

Contingency Tables

		Rehire		Total
		No	Yes	
Female	Observed	22	28	50
	Expected	20.9	29.1	50.0
Male	Observed	14	22	36
	Expected	15.1	20.9	36.0
Total	Observed	36	50	86
	Expected	36.0	50.0	86.0

Table 15: Chi Sq Test for Hypothesis 1

χ^2 Tests

	Value	df	p
χ^2	0.225	1	0.636
χ^2 continuity correction	0.0637	1	0.801
N	86		

The analysis is conducted at 95% confidence level. The p value is greater than α value (0.05), therefore we fail to reject the null hypothesis.

Table 16: Contingency Table for Hypothesis 2

Contingency Tables

		Rehire		Total
		No	Yes	
Bachelors	Observed	16	26	42
	Expected	17.6	24.4	42.0
Diploma	Observed	20	24	44
	Expected	18.4	25.6	44.0
Total	Observed	36	50	86
	Expected	36.0	50.0	86.0

Table 17: Chi Sq Test for Hypothesis 2

 χ^2 Tests

	Value	df	p
χ^2	0.478	1	0.489
χ^2 continuity correction	0.224	1	0.636
N	86		

The analysis is conducted at 95% confidence level. The p value is greater than α value (0.05), therefore we fail to reject the null hypothesis.

Table 18: Contingency table for hypothesis 3

Contingency Tables

		Rehire		Total
		No	Yes	
No	Observed	23	20	43
	Expected	18.0	25.0	43.0
Yes	Observed	13	30	43
	Expected	18.0	25.0	43.0
Total	Observed	36	50	86
	Expected	36.0	50.0	86.0

Table 19: Chi Sq Test for Hypothesis 3

χ^2 Tests			
	Value	df	p
χ^2	4.78	1	0.029
χ^2 continuity correction	3.87	1	0.049
N	86		

The analysis is conducted at 95% confidence level. The p value is slightly less than α value (0.05), therefore we may reject the null hypothesis. But when Binomial Logistic Regression is performed, the variable award is not significant.