HR ANALYTICS USING R

Exploring Employee Data

Abstract

Businesses often face key challenges in identifying right set of employees to grow organization revenue and improve culture. Our data analysis tries to answer these questions by focusing on Identifying the best recruitment source, factors driving low employee engagement, performance of new employee's vis-s-vis their salary, evaluation of consistency in performance rating process, and improving employee safety

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HR Analytics in R

Exploring Employee Data

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1. BQ - 1 Identify the best recruitment source

Summary of recruitment data

```
> summary(recruitment)
   attrition      performance_rating sales_quota_pct   recruiting_source
 Min.   :0.000   Min.   :1.000      Min.   :-0.7108   Length:446
 1st Qu.:0.000   1st Qu.:2.000      1st Qu.: 0.5844   Class :character
 Median :0.000   Median :3.000      Median : 1.0701   Mode  :character
 Mean   :0.213   Mean   :2.895      Mean   : 1.0826
 3rd Qu.:0.000   3rd Qu.:3.000      3rd Qu.: 1.5325
 Max.   :1.000   Max.   :5.000      Max.   : 3.6667
```

Count of Recruiting Sources

```
> # See which recruiting sources the company has been using
> recruitment %>% count(recruiting_source)
# A tibble: 5 x 2
  recruiting_source     n
  <chr>             <int>
1 Applied Online      130
2 Campus               56
3 Referral             45
4 Search Firm          10
5 <NA>                205
```

Sales numbers by recruiting source

Which recruiting channel produces the best salespeople? One quality of hire metric you can use is sales quota attainment, or how much a salesperson sold last year relative to their quota. An employee whose `sales_quota_pct` equals .75 sold 75% of their quota, for example. This metric can be helpful because raw sales numbers are not always comparable between employees.

Calculate the average sales quota attainment achieved by hires from each recruiting source.

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```
> recruitment %>% group_by(recruiting_source) %>% summarize(avg_sales_quota_pct = mean
    (sales_quota_pct))
# A tibble: 5 x 2
  recruiting_source avg_sales_quota_pct
  <chr>                           <dbl>
1 Applied Online                  1.06
2 Campus                          0.908
3 Referral                        1.02
4 Search Firm                     0.887
5 <NA>                            1.17
```

```
> recruitment %>%
    summarize(avg_sales_quota_pct = mean(sales_quota_pct))
# A tibble: 1 x 1
  avg_sales_quota_pct
                <dbl>
1                1.08
```

```
> # Find the average sales quota attainment for each recruiting source
> avg_sales <- recruitment %>% group_by(recruiting_source) %>% summarize(avg_sales_quota_pct =
    mean(sales_quota_pct))
>
> # Display the result
> avg_sales
# A tibble: 5 x 2
  recruiting_source avg_sales_quota_pct
  <chr>                           <dbl>
1 Applied Online                  1.06
2 Campus                          0.908
3 Referral                        1.02
4 Search Firm                     0.887
5 <NA>                            1.17
```

Attrition rates by recruiting source

Another quality of hire metric you can consider is the attrition rate, or how often hires leave the company. Determine which recruiting channels have the highest and lowest attrition rates.

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In the last exercise, the output was a data frame with the recruiting channels and the average quota attainment. It would have been easier to tell which channel had the highest-performing employees if it were sorted with `arrange()`.

```
> # Find the average attrition for the sales team, by recruiting source, sorted from lowest
    attrition rate to highest
> avg_attrition <- recruitment %>%
    group_by(recruiting_source) %>%
    summarize(attrition_rate = mean(attrition)) %>%
    arrange(attrition_rate)
>
> # Display the result
> avg_attrition
# A tibble: 5 x 2
  recruiting_source attrition_rate
  <chr>                      <dbl>
1 <NA>                       0.132
2 Applied Online             0.246
3 Campus                     0.286
4 Referral                   0.333
5 Search Firm                0.5
```

Visualizing the recruiting data

The last step in the HR analytics process is to test and plot the results. For now, you'll focus on visualizing the data from the previous exercises. You'll be making a bar chart, so you can more easily see the average sales quota attainment for each recruiting channel.

```
> # Load the ggplot2 package
> library(ggplot2)
>
> # Plot the bar chart
> ggplot(avg_sales, aes(x = recruiting_source, y = avg_sales_quota_pct)) +
    geom_col()
>
```


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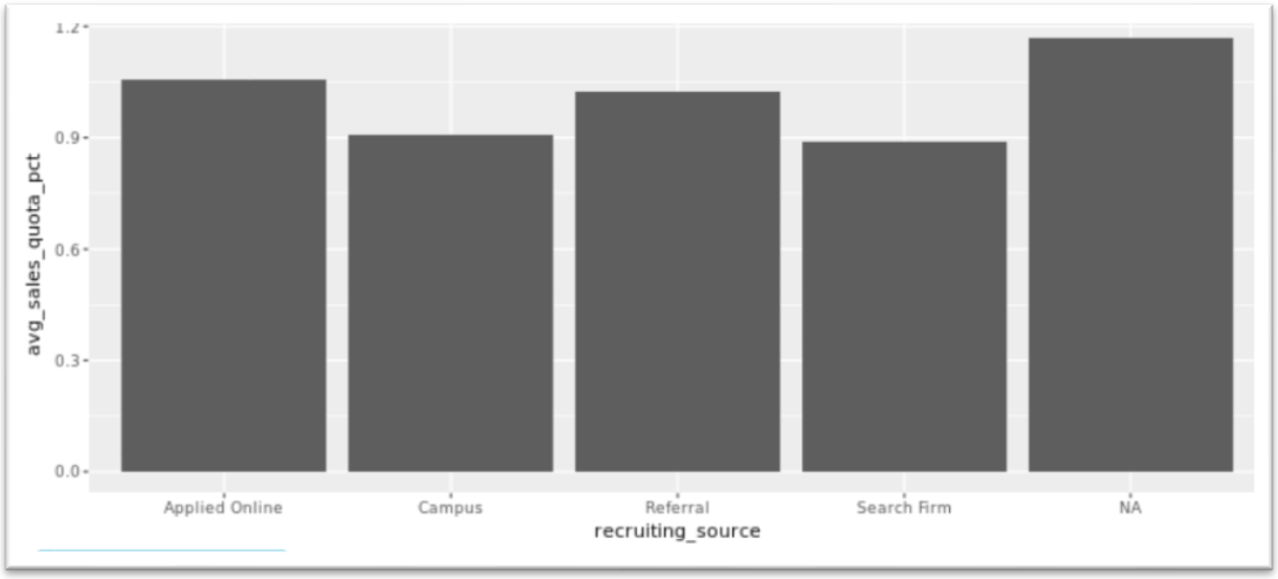

Visualizing the attrition differences

We have used two quality of hire metrics to compare the recruiting channels. In addition to looking at the sales output of the hires, we are also looking at the attrition rates. Plot a bar chart for average attrition instead of sales quota attainment.

```
> # Plot the bar chart
> ggplot(avg_attrition, aes(x = recruiting_source, y = attrition_rate)) +
    geom_col()
>
```


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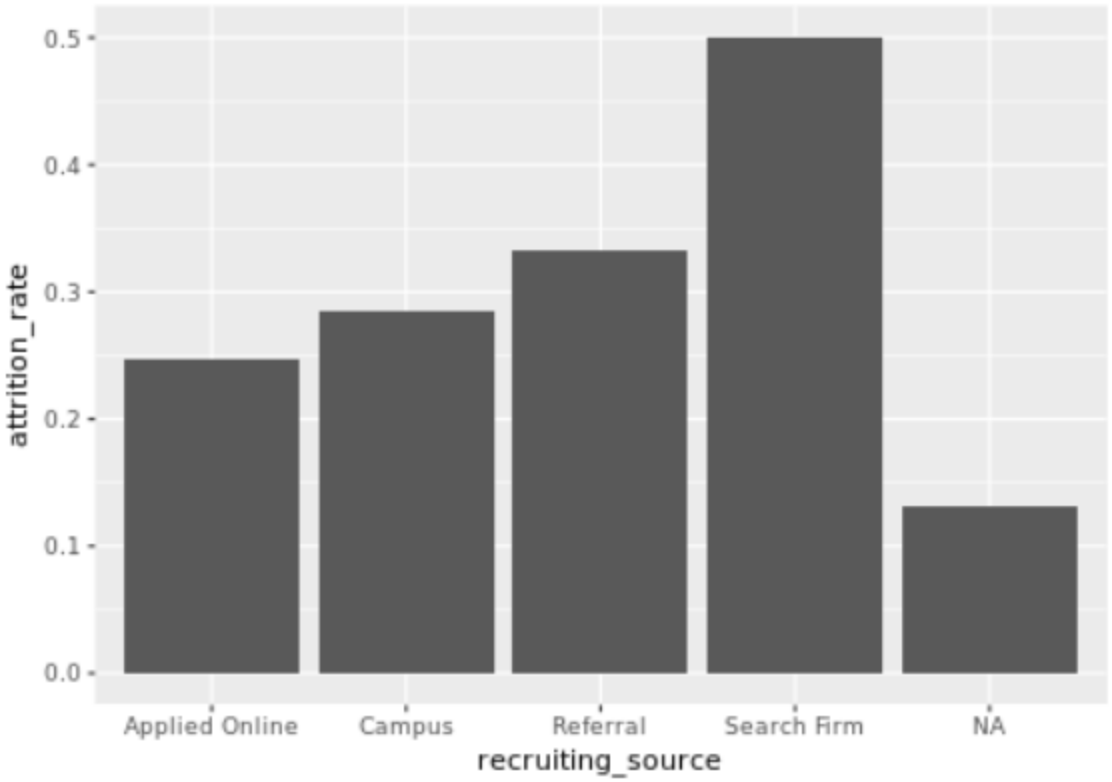

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Conclusion

Employees recruited from Search Firm are worst performing when it comes to attrition rate and sales quota accomplished. Employees who Applied Online have done best (2nd in terms of metrics. Thus, our client can be more careful while hiring from Search Firms. We agree that at times, there is no option but to source employees from Search Firms, but our client can reevaluate its search firm partners can take appropriate corrective measures and increase its intake from Online Applications.

References

1. www.datacamp.com for 'dplyr' library tutorial

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