PWC SWITZERLAND POWER BI IN DATA ANALYTICS VIRTUAL CASE EXPERIENCE

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About Me

DATA ANALYST

I'm a systematic Data Analyst with significant experience in defining KPIs, data consolidation, transformation, modeling, creating reports, creating dashboards, and sharing insights.

I am proficient in the use of data analysis tools such as MS Excel, Power BI, Tableau, SQL, Azure, and Python. Successfully completed PwC Switzerland Power BI in Data Analytics Virtual Case Experience, Accenture Data Analytics and Visualization Virtual Experience and Tata Group Data Visualization: Empowering Business with Effective Insights - Internship.

I strives to answer questions, and solve business problems with quantitative-driven insights.

Through my work experiences, Internships, development of personal projects, and valuable training, I have learned the importance of having an iterative, hypothesis-oriented approach to analysis.

I am a graduate of Chemical Engineering and possesses demonstrated skills in Stakeholder Relationships, Soft Skills, Supply Chain & Logistics, Project Management, Engineering Safety, Digital marketing, Administration, etc.

Outline

PROJECT 1

CALL CENTRE TREND ANALYSIS – VISUALIZING CUSTOMER AND AGENT BEHAVIOUR

About Project

CALL CENTRE TREND ANALYSIS - VISUALIZING CUSTOMER AND AGENT BEHAVIOUR

This Analysis is carried out during my Virtual Case Experience with PwC Switzerland. During this experience, I created a dashboard in Power BI for a client that reflects all relevant Key Performance Indicators (KPIs) and metrics in the dataset.

Case Study

BACKGROUND INFORMATION

In a hypothetical situation, I have been tasked to create a dashboard in Power BI for Claire that reflects all relevant Key Performance Indicators (KPIs) and metrics in the dataset >>> can be found **here**

Below was the email I got from a client at PhoneNow requesting for transparency and insight into their data at the Call Centre

Request: Call Centre Trends

Claire (PhoneNow)
To ● You

↩ Reply   ↞ Reply All   → Forward   …

Hi Digital Accelerator,

May I introduce myself? I'm Claire, Call Centre Manager here at PhoneNow. My colleague suggested I reach out to you. Pleased to meet you.

I'm looking for transparency and insight into the data we have here at the Call Centre. For example: total number of calls answered and abandoned, speed of answer, length of calls, overall customer satisfaction, etc. What I'm after is an accurate overview of long-term trends in customer and agent behaviour.

I was told you are great at visualising data in such a way that important aspects become very clear. That's precisely what I need. Could you please prepare a dashboard on Call Centre trends that I can use as a basis for discussion with management? I'll provide you with the required data, of course.

Looking forward to hearing from you.
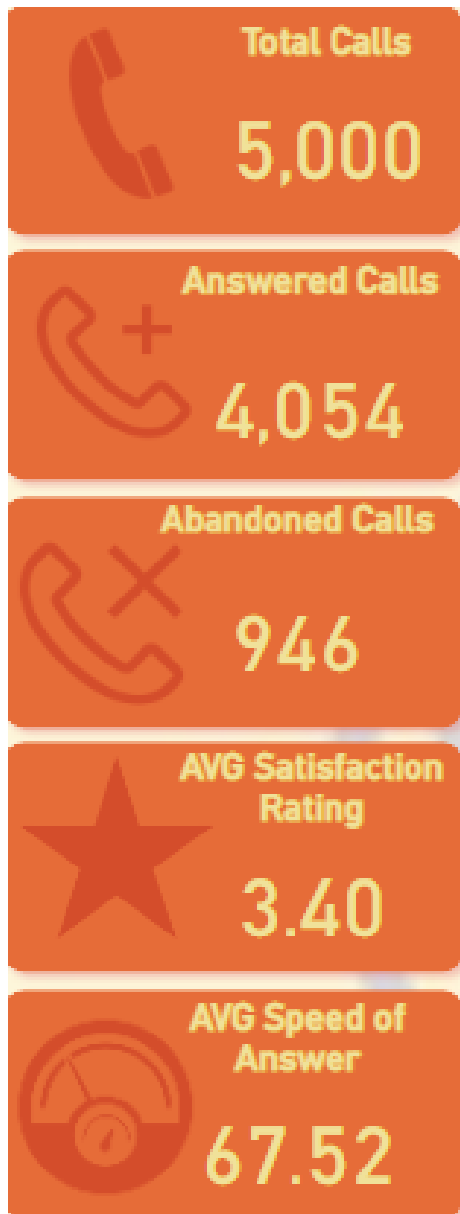
Best regards,
Claire

Defining KPIs

I defined possible KPIs to get me started which include, but not limited to:

- Overall customer satisfaction

- Overall calls answered & abandoned

- Calls by time

- Average speed of answer

- Agent's performance quadrant –> average handle time (talk duration) vs calls answered

Analysis

FIG 1: MEASURES

Total Calls	
	5,000

Answered Calls	
	4,054

Abandoned Calls	
	946

AVG Satisfaction Rating	
	3.40

AVG Speed of Answer	
	67.52

The business received a total of 5,000 calls, out of which 4,054 calls were successfully answered by the call agents, and 946 calls were abandoned, indicating a potential area of improvement in call handling or wait times.

On average, customers gave a satisfaction rating of 3.40, which may suggest that there is room for improvement in meeting customer needs and expectations. Additionally, the average speed of call answer was 67.52 seconds, which is a key performance indicator for call centers and may impact customer satisfaction.

It is important to note that the satisfaction rating and speed of call answer are interdependent, and addressing one metric may improve the other. For example, improving the speed of call answer may lead to increased customer satisfaction, as long wait times can lead to frustration and dissatisfaction. Similarly, increasing customer satisfaction may lead to a higher likelihood of customers staying on the line and waiting for an agent to answer their call.

Overall, these metrics provide valuable insights into the performance of the call center and can guide improvements to better meet customer needs and expectations.

FIG 2: RESOLVED VS NOT RESOLVED CALLS

Resolved and Not Resolved by Topic

● Resolved ● Not Resolved

Topic	Not Resolved	Resolved
Streaming	273	749
Technical Support	283	736
Payment related	278	729
Admin Support	253	723
Contract related	267	709

In terms of the number of resolved topics, Streaming and Technical Support emerge as the top two categories. However, while Technical Support has the highest number of unresolved issues, Contract-related topics have the lowest number of resolved issues, with only 709 issues resolved.

This suggests that while Streaming and Technical Support are relatively well-resourced and effective at resolving customer issues, Contract-related topics may require more attention and resources to improve customer satisfaction. Additionally, the high number of unresolved technical support issues may indicate a need for more robust technical support services or improvements in the effectiveness of existing support channels.

FIG 3: TOTAL CALLS BY MONTH
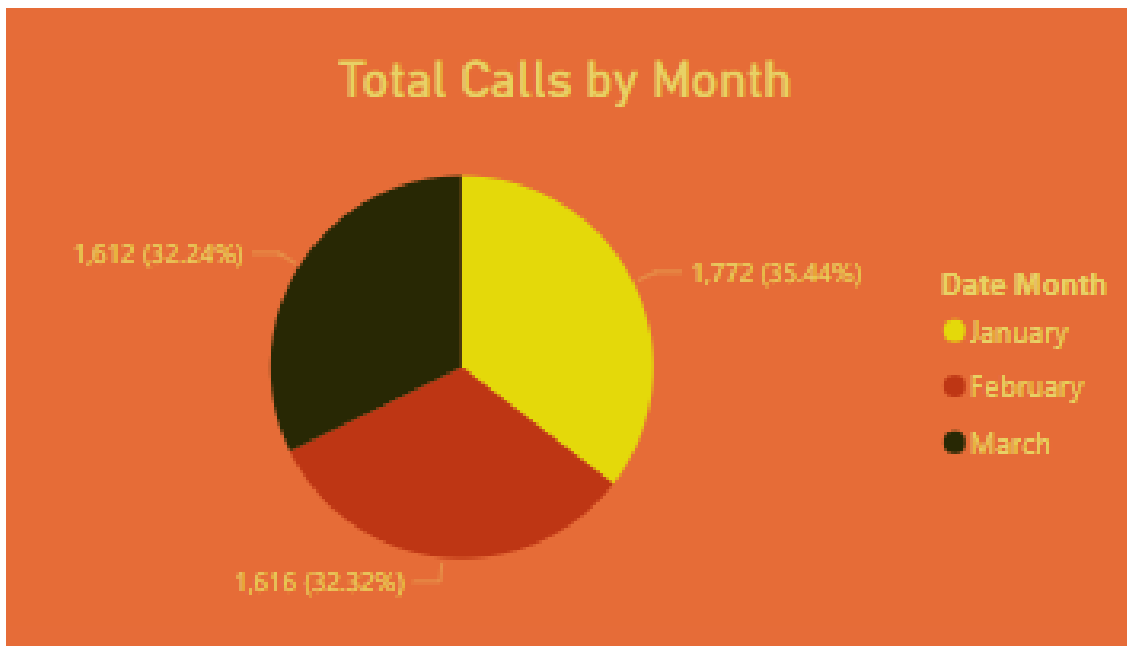
Out of all the months, January had the highest number of calls made with a total of 1,772, followed by February with 1,616 calls and March with 1,612 calls. Interestingly, January alone accounted for 35.44% of all the calls made over the entire period.

This indicates that January was a particularly busy period, potentially due to specific events or circumstances such as holidays or seasonal changes. It is worth investigating why January had such a high call volume, and if there are any patterns or trends that could help better allocate resources in the future. Additionally, the relatively high number of calls made in February and March suggest that these months also require careful monitoring and attention to ensure customer satisfaction.

TAB 1: AGENTS SCORE

Agent Score

Agent	Total Calls	Answered Call	Abandoned Call	% Answered Call	Talk Duration in mins
Jim	666	536	130	124%	1,767
Dan	633	523	110	121%	1,741
Becky	631	517	114	122%	1,638
Martha	638	514	124	124%	1,662
Greg	624	502	122	124%	1,653
Diane	633	501	132	126%	1,580
Joe	593	484	109	123%	1,558
Stewart	582	477	105	122%	1,557
Total	5,000	4,054	946	123%	13,156

The call center employs a total of eight agents to answer customer calls. Among these agents, Diane has the highest percentage of answered calls at 126%, which is significantly higher than the agent with the lowest percentage of answered calls, Dan, who had only 121% of calls answered. Diane's high percentage of answered calls indicates that she is highly effective and efficient in handling customer inquiries, which is a valuable asset for the call center. Conversely, Dan's lower percentage of answered calls may be an area for improvement, as he may benefit from additional training or support to better address customer needs.

Overall, the performance of the call agents can have a significant impact on customer satisfaction and the success of the call center, and it is essential to regularly monitor and address any areas of concern.

Conclusion

In conclusion, the insights provide valuable information about the performance of the call center and its agents. The data shows that while the call center received a total of 5,000 calls, there is room for improvement in call handling and wait times as 946 calls were abandoned. The average customer satisfaction rating of 3.40 and average speed of call answer of 67.52 seconds suggest that the call center may need to focus on improving customer satisfaction.

The insights also highlight the importance of call agent performance, with Diane standing out as the most effective agent, and Dan's lower percentage of answered calls indicating an area for improvement. Additionally, the insights demonstrate that January had the highest number of calls made, potentially requiring additional resources to manage the high volume.

Finally, the data indicates that Streaming and Technical Support are relatively effective in resolving customer issues, but Contract-related topics require more attention and resources. Overall, the insights provide valuable guidance for the call center to improve customer satisfaction and better meet customer needs and expectations.

PROJECT 2

CUSTOMER RETENTION – CHURN ANALYSIS

About Project

CUSTOMER RETENTION – CHURN ANALYSIS

This Analysis is carried out during my Virtual Case Experience with PwC Switzerland. During this experience, I defined proper KPIs, created a dashboard for the retention manager reflecting the KPIs, and wrote a short email to him (the engagement partner) explaining my findings, and included suggestions as to what needs to be changed

Case Study

BACKGROUND INFORMATION

Still in a hypothetical situation, a few weeks after presenting my dashboard to the management, the Retention Manager from the telecom reaches out to me directly. He was impressed by my work and asked if I can put together a dashboard about customer retention by defining proper KPIs, create a dashboard reflecting the KPIs, and write a short email to him explaining my findings, and include suggestions as to what needs to be changed
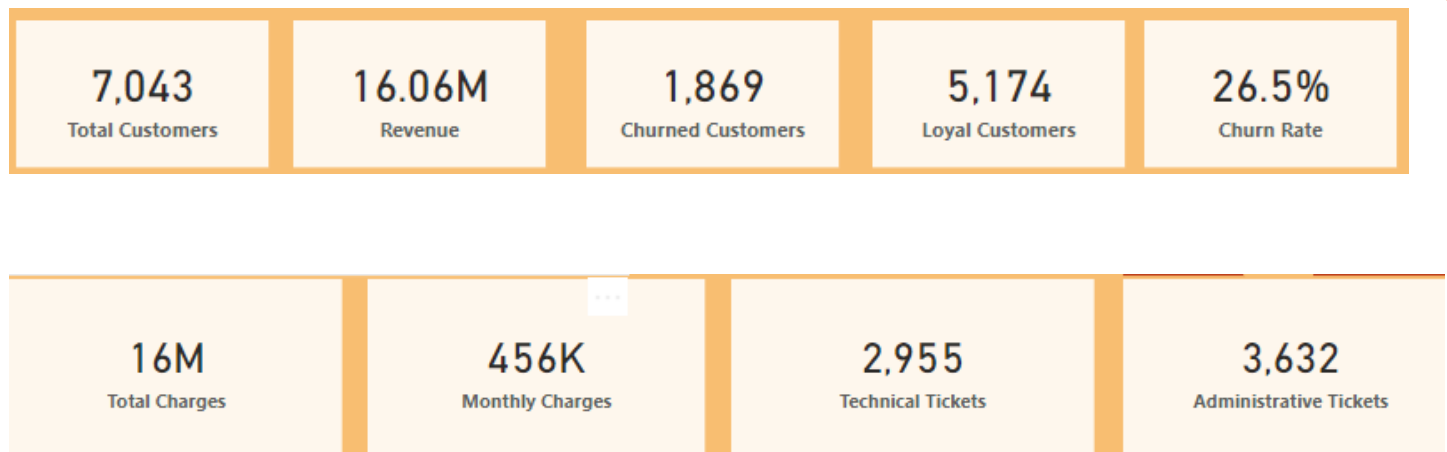
The dataset can be found >>> **here**

Defining KPIs

I defined possible KPIs to get me started which include, but not limited to:

- Customers who left within the last month.

- Services each customer has signed up for: phone, multiple lines, internet, online security, online backup, device protection, tech support, and streaming TV and movies.

- Customer account information: how long as a customer, contract, payment method, paperless billing, monthly charges, total charges and number of tickets opened in the categories administrative and technical.

- Demographic info about customers – gender, age range, and if they have partners and dependents

Analysis

FIG 4: MEASURES

7,043	16.06M	1,869	5,174	26.5%
Total Customers	Revenue	Churned Customers	Loyal Customers	Churn Rate

| 16M	456K	2,955	3,632
Total Charges	Monthly Charges	Technical Tickets	Administrative Tickets

The business has a significant number of loyal customers, with 5,174 out of a total of 7,043 customers. However, there were also 1,869 churned customers, which represents a churn rate of 26.5%. This indicates a potential area for improvement in customer retention strategies to reduce churn and retain more customers in the long run.

Despite the churn rate, the business generated a revenue of 16M, which suggests that loyal customers may be a significant source of revenue for the business. It is important to focus on retaining these customers while also exploring strategies to attract new customers.

In terms of customer support, the business received a total of 3,632 administrative tickets and 2,955 technical tickets. These figures can provide insights into the types of issues customers are experiencing and can guide resource allocation and training efforts for customer support agents.

Overall, a focus on customer retention and support can help the business maintain and grow its revenue, while reducing churn and improving customer satisfaction.

FIG 5: TENURE BY CONTRACT
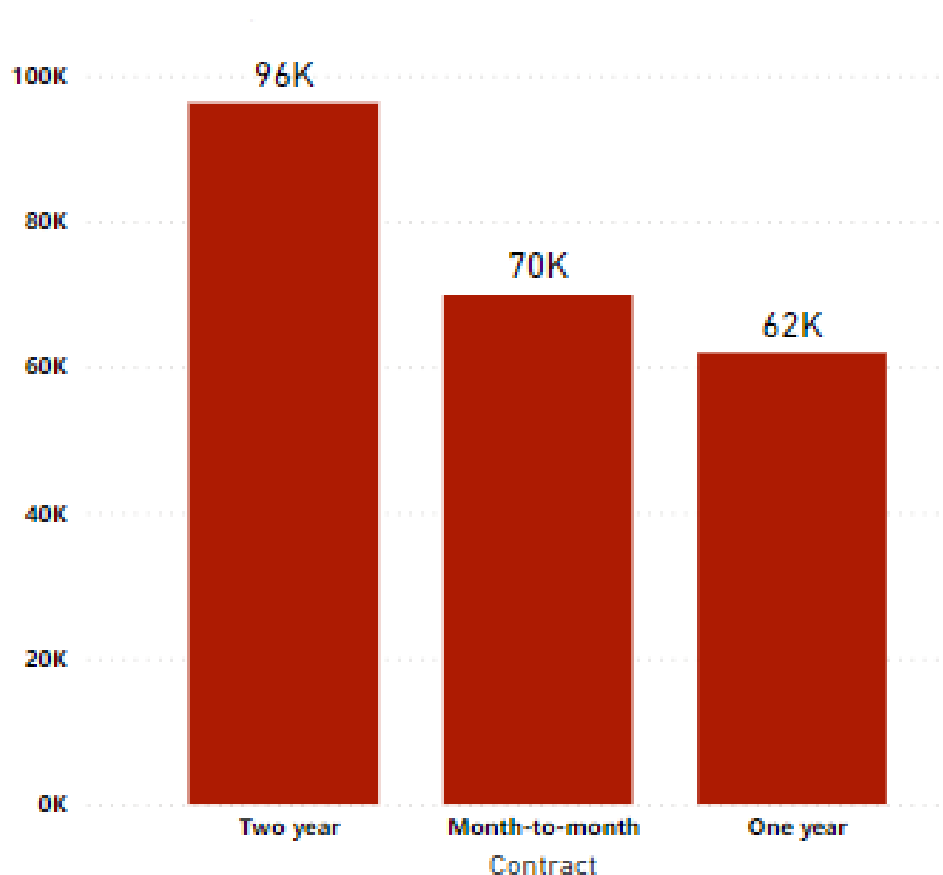
The data shows that customers with two year contracts had the highest number of tenures at 96,166, followed by customers with Month-to-month contracts at 69,892 tenures and One year contracts at 61,932 tenures. This suggests that customers who commit to longer-term contracts are more likely to stay with the business over an extended period.

Furthermore, the significant difference between the number of customers with two year contracts and those with One year contracts indicates that the business may want to consider strategies to encourage customers to choose longer-term contracts. These strategies may include offering discounts or incentives for customers who commit to a longer contract period.

It is also worth noting that customers with Month-to-month contracts had a relatively high number of tenures, indicating that there may be value in offering more flexible contract options for customers who prefer short-term commitments. By providing a range of contract options, the business may be better able to meet the diverse needs and preferences of its customers.

FIG 6: CHURNED AND LOYAL CUSTOMERS BY PAYMENT METHOD

Churned Customers and Loyal Customers by PaymentMethod
● Churned Customers ● Loyal Customers
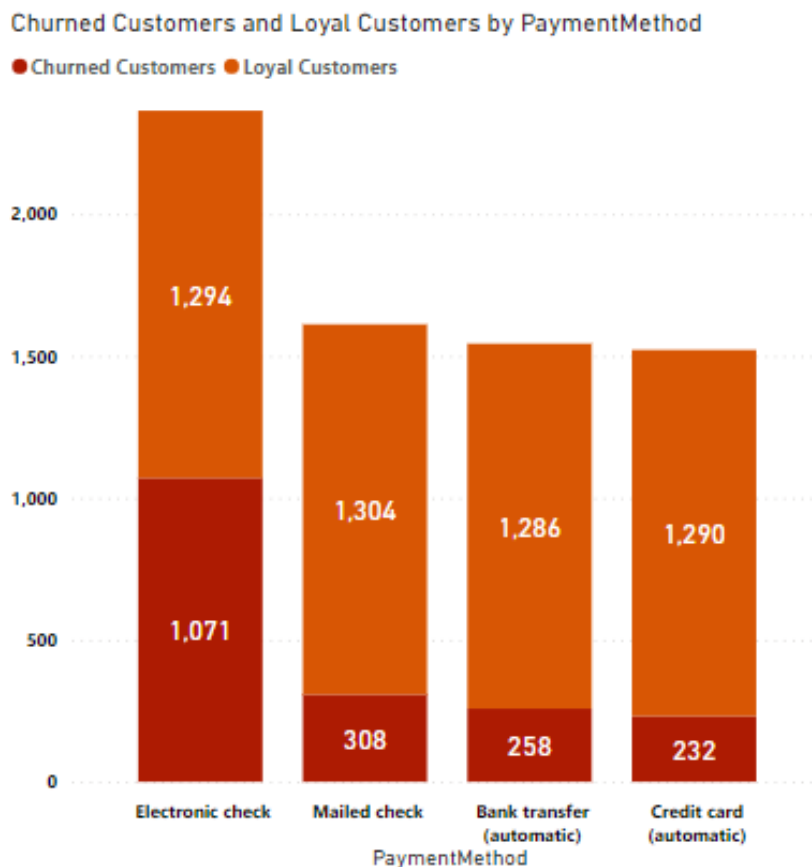
The chart shows that Electronic check payment method had the highest number of churned customers at 1,071, which was significantly higher than the credit card (automatic) payment method with the lowest number of churned customers at 232. This highlights the importance of payment method options and how they can impact customer retention.

Furthermore, it is interesting to note that across all four payment methods, the range of churned customers was relatively narrow, ranging from 232 to 1,071. In contrast, the range of loyal customers was even narrower, ranging from 1,286 to 1,304. This suggests that the differences in payment methods may not be the only factor contributing to customer retention.

Overall, these insights suggest that payment methods are an important consideration for businesses looking to improve customer retention. By offering a variety of payment options and ensuring a seamless payment experience, businesses can potentially reduce the number of churned customers and increase customer loyalty.

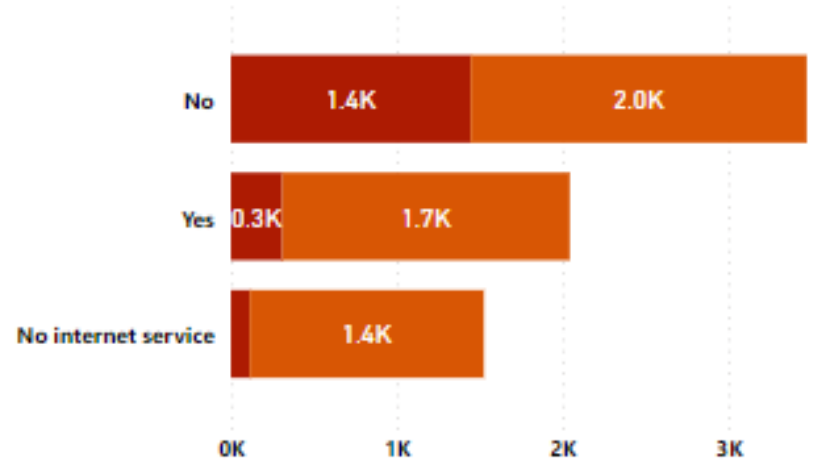# FIG 7: CHURNED AND LOYAL CUSTOMERS DIFFERENT SERVICES

Customers by OnlineSecurity
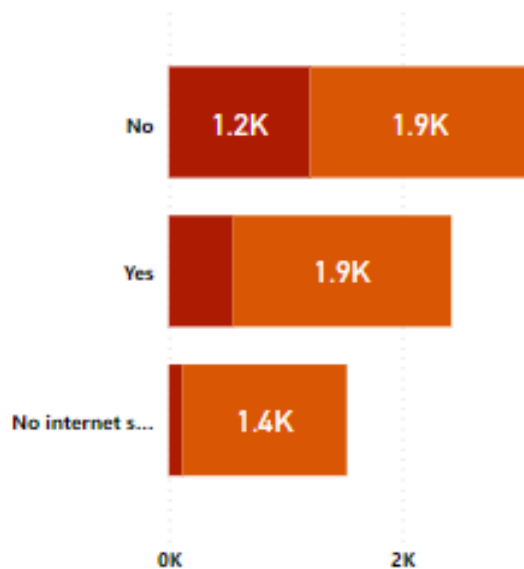
● Churned Customers ● Loyal Customers
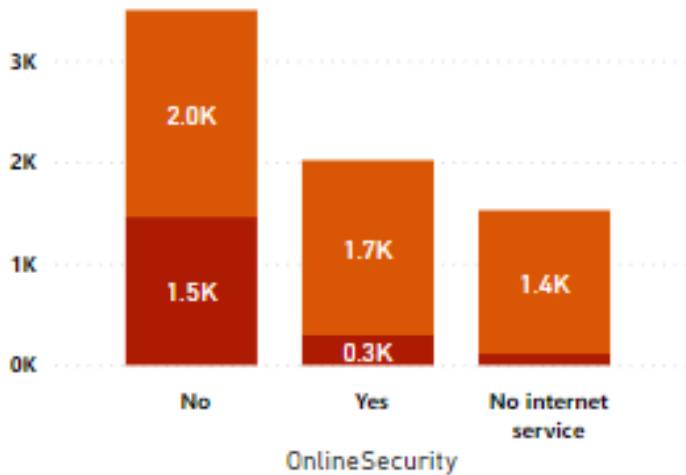
Customers by TechSupport

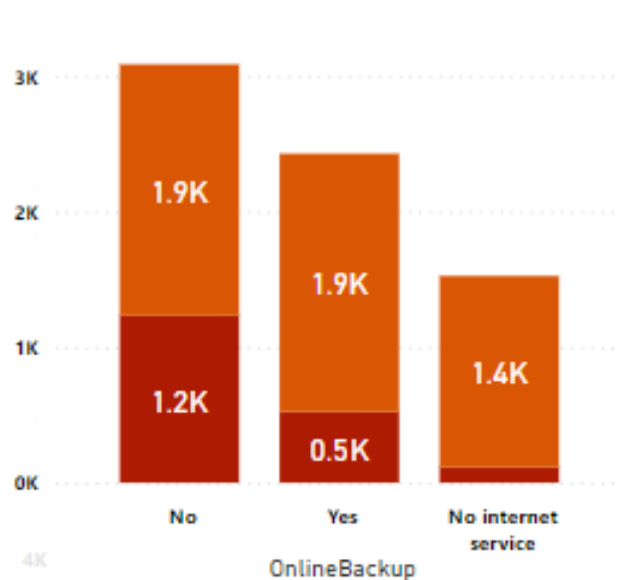● Churned Customers ● Loyal Customers

Customers by DeviceProtection

● Churned Customers ● Loyal Customers

Customers by OnlineBackup

● Churned Customers ● Loyal Customers

The analysis indicates that customers without online security, backup, tech support, or device protection are the most likely to churn. This highlights the importance of providing comprehensive support services to customers, as those who feel unsupported may be more likely to switch to a competitor.

Conclusion

Based on the insights, it is evident that customer retention is a crucial area that the business should focus on to maintain and grow its revenue. The business has a significant number of loyal customers, but there are still churned customers, indicating the need for improved retention strategies. The data also shows that customers who commit to longer-term contracts are more likely to stay with the business, highlighting the importance of offering flexible contract options.

Furthermore, payment methods and support services are other factors that can impact customer retention. The business should consider offering a variety of payment options to ensure a seamless payment experience, while also providing comprehensive support services to customers, especially those without online security, backup, tech support, or device protection.

Overall, these insights provide valuable information that can guide the business in developing and implementing effective strategies to improve customer retention, satisfaction, and ultimately, revenue growth.

PROJECT 3

DIVERSITY AND INCLUSION – GENDER BALANCE IN THE EXECUTIVE SUIT

About Project

DIVERSITY AND INCLUSION – GENDER BALANCE IN THE EXECUTIVE SUIT

This Analysis is carried out during my Virtual Case Experience with PwC Switzerland. During this experience, I defined relevant KPIs in hiring, promotion, performance and turnover, and created a visualisation.

Case Study

BACKGROUND INFORMATION

In a hypothetical situation, a few weeks after presenting my dashboard to the management, the Human Resources at our telecom client is highly into diversity and inclusion. They've been working hard to improve gender balance at the executive management level, but they're not seeing any progress. They're reaching out to us for help to defined relevant KPIs in hiring, promotion, performance and turnover, and created a visualization and also note down what I think some root causes of their slow progress might be

The dataset can be found >>> **Here**

Defining KPIs

I calculated the following measures which helped me to define proper KPIs:

- Number of men
- Number of women
- Number of leavers
- % employees promoted (FY21)
- % of women promoted
- % of hires men
- % of hires women
- % turnover
- Average performance rating: men
- Average Performance rating: women

I now defined possible KPIs to get me started which include;

- Recruitment/Hiring Figures
- Promotion Figures
- Representation Figures
- Employee Diversity Figures
- Demographic Figures
- Performance Ratings

Analysis

FIG 8: MEASURES

| 295	205	500
Men	Women	Employees
66	87	47
New Hired Employees	Total Promoted	No of Leavers
32%	22%	10.2%
% of Women Hired	% of Men Hired	% of Employees Promoted FY21

The organization had a total of 500 employees, with 295 men and 205 women. This gender breakdown highlights the potential for gender diversity initiatives within the organization.

Over the course of the reporting period, 87 employees were promoted, indicating that there are opportunities for career advancement within the organization. However, 47 employees left the organization, indicating that retention may be an area for improvement.

Additionally, the fact that 66 employees were newly hired suggests that the organization is actively recruiting and seeking to expand its workforce. It may be worth considering the effectiveness of recruitment strategies and whether they are attracting a diverse pool of candidates.

FIG 9: TENURE BY DEPARTMENT

Women and Men Employees by Year

● Women ● Men
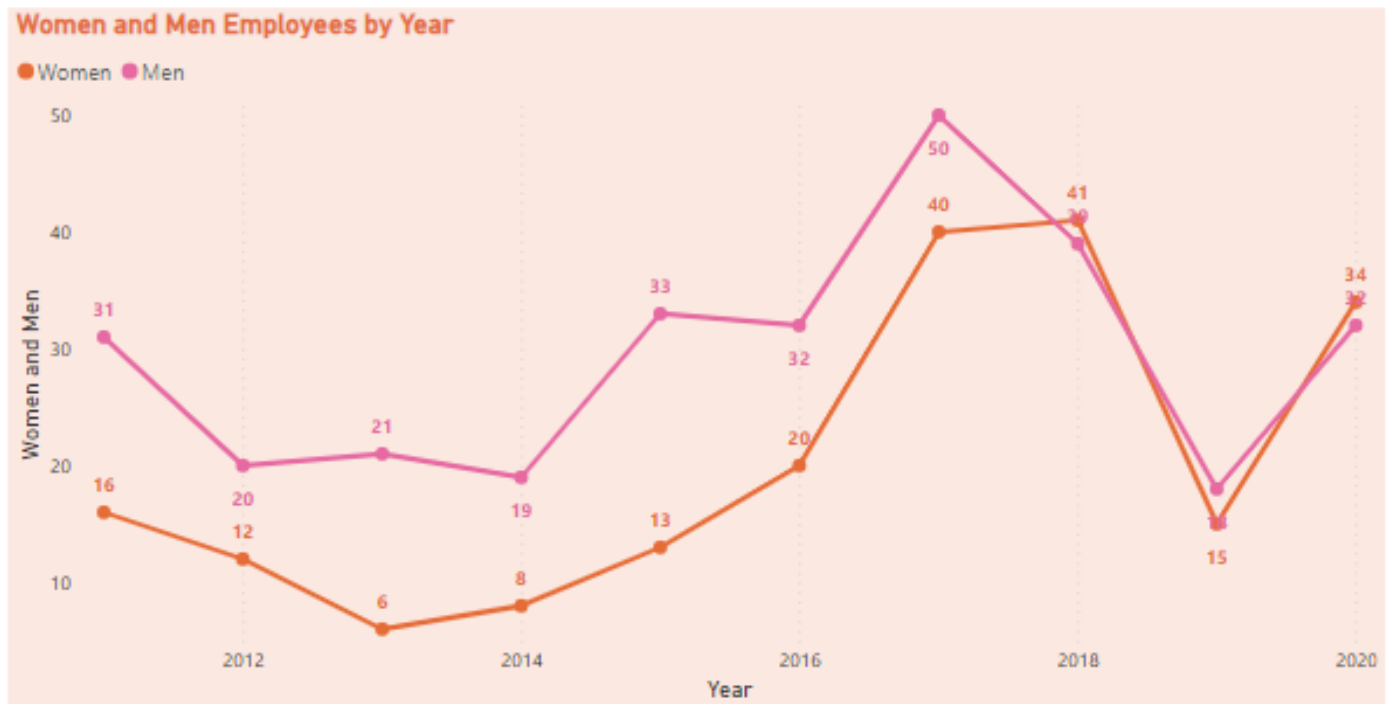
The number of women employees in the organization increased significantly by 325%, from 2014 to 2020 rising from 8 in 2014 to 34 in 2020. This upward trend suggests that the organization may be making strides towards gender diversity and inclusivity in its hiring practices.

However, despite the significant increase in women employees, it is important to monitor and address any potential gender disparities in terms of promotions, pay, and other opportunities within the organization. By actively promoting gender diversity and inclusivity, the organization may be able to attract and retain talented employees from diverse backgrounds, which can ultimately benefit the organization as a whole.

FIG 10: TENURE BY DEPARTMENT

Employees Promoted FY21 by Job Level after FY21 promotions
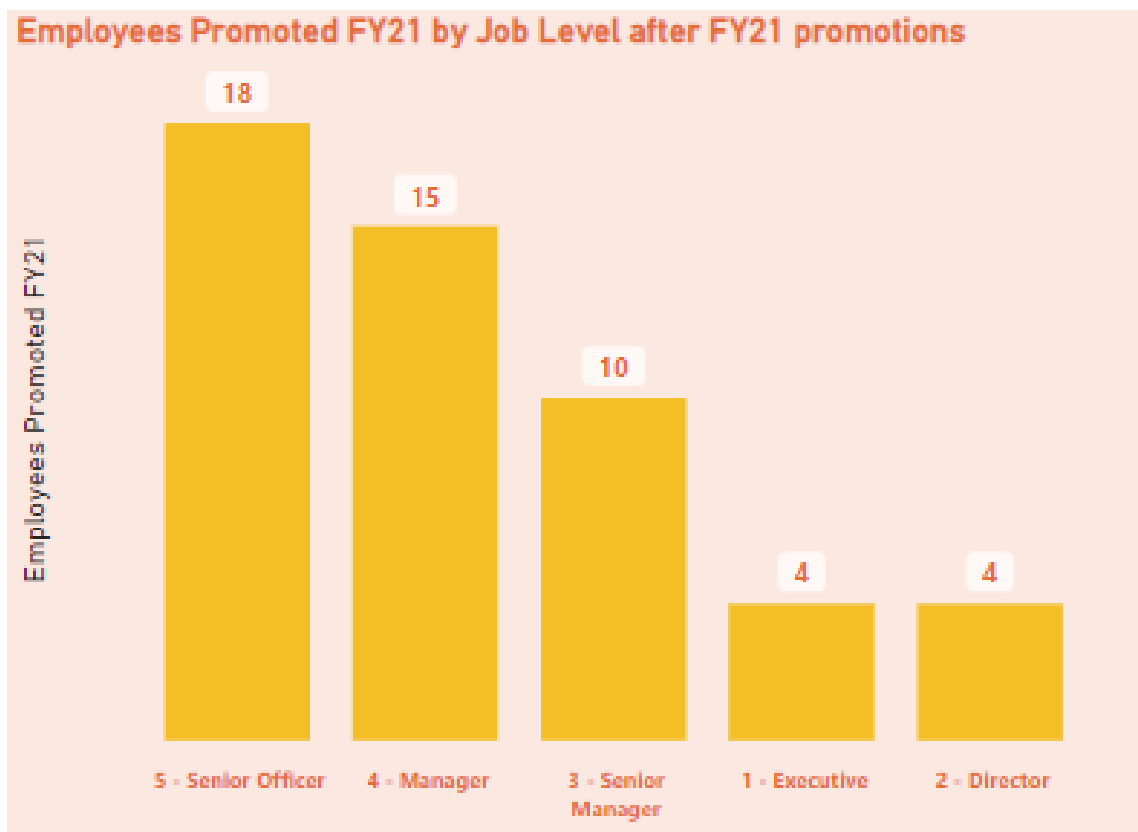
In FY21, the number of promotions was highest for the Senior Officer job level at 18, with Manager and Senior Manager following closely behind. This suggests that the organization is prioritizing promotions for employees in these higher-level positions. It may be worthwhile to assess the performance and potential of employees at other job levels to ensure equitable opportunities for career advancement.

Additionally, it is worth noting that promotions in FY21 ranged from 4 to 18 across all five job levels, indicating that there may be disparities in the distribution of promotion opportunities. Identifying any patterns or trends in these promotions, such as demographic characteristics or performance metrics, can help the organization to better understand and address any potential inequalities in its promotion practices.

TAB 2: TENURE BY DEPARTMENT

Job Level After FY21 by Gender		
Job Level after FY21 promotions	Men	Women
	26	21
1 - Executive	16	3
2 - Director	29	4
3 - Senior Manager	46	11
4 - Manager	54	25
5 - Senior Officer	46	50
6 - Junior Officer	78	91

Job Level After FY20 by Gender		
Job Level before FY20 promotions	Men	Women
	32	34
1 - Executive	8	2
2 - Director	28	4
3 - Senior Manager	35	6
4 - Manager	46	24
5 - Senior Officer	53	35
6 - Junior Officer	93	100

After the FY21, there was a significant disparity between the number of males and females promoted to executive level positions. Out of a total of 9 employees promoted to executive level, only 1 was female while 8 were male. This highlights a potential gender bias in the organization's promotion policies and practices, which could have negative implications for diversity, equity, and inclusion within the company.

It is important for the organization to investigate the reasons behind this disparity and take corrective measures to ensure that promotion decisions are based solely on merit and not influenced by gender or any other demographic characteristic. Strategies such as setting diversity targets, establishing mentorship programs, and providing unconscious bias training for managers could help address this issue and promote a more inclusive workplace culture.

FIG 11: TENURE BY DEPARTMENT

New Hired Employees by Age group

Among newly hired employees, the age groups of 20-29 and 30-39 had the highest number of hires, suggesting that the organization may be targeting younger professionals and mid-career individuals for recruitment. On the other hand, the age group of 50-59 had the lowest number of newly hired employees, which could be due to a number of factors such as retirement or a lack of emphasis on hiring older workers. Additional data on the distribution of age groups among existing employees and the organization's overall recruitment strategies could provide further insights into workforce demographics and potential opportunities for diversity and inclusion.

Conclusion

In conclusion, these insights provide a holistic view of the organization's workforce and suggest potential areas for improvement in terms of diversity, equity, and inclusion. The organization's gender breakdown shows the need for gender diversity initiatives, and the significant increase in women employees highlights the potential for progress in this area. However, the organization needs to address potential disparities in promotions, particularly at the executive level, to ensure equal opportunities for all employees.

The organization's high number of promotions suggests that there are opportunities for career advancement, but the disparities in promotion opportunities across job levels and potentially by demographic characteristics need to be addressed. Additionally, the high number of newly hired employees in the younger age groups suggests that the organization may need to consider recruitment strategies to attract diverse candidates from all age groups.

Overall, addressing these issues can contribute to a more inclusive workplace culture, attract and retain talented employees from diverse backgrounds, and ultimately benefit the organization as a whole.

Appendix

Call Centre Trend Analysis dataset >>> [Here](#)
Call Centre Trend Analysis Power BI Visualization >>> [Here](#)

Customer Retention – Churn Analysis dataset >>> [Here](#)
Customer Retention – Churn Analysis Power BI >>> [Here](#)

Diversity and Inclusion   dataset >>> [Here](#)
Diversity and Inclusion   Power BI >>> [Here](#)