**Capstone Final Project**

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**Introduction**

Identifying business performance in different segments of ABC and recommendations for improvement was the purpose of this analysis. As a system specialist, I have analyzed the IT help desk's performance, employee attrition, telco customer churn, account receivable, operation of Dem bike share planning, retail sales profit and cost, and marketing campaign for new product promotion. I have utilized Microsoft Power BI to analyze and visualize my work as instructed. Also, a recommendation for implementing information security policies has been an additional part of this analysis.

**IT Help Desk**

IT help desk's performance is measured based on the number of tickets open and closed within the specific period. Between 2013 and 2017, a total of 100,000 service tickets were generated with ABC's IT help desk. The highest number of tickets totaling 20177 indicated that the highest number of service issues occurred in 2016.

Similarly, my analysis revealed that customer satisfaction and average ticket open-days had an inverse relationship, which means if lower the ticket closing days higher would be the satisfaction rating and vice versa. And, it was found that on average, customers were satisfied with the service if the tickets were closed before seven days. The highest influencing factor of customer satisfaction was ticket against hardware service, which had an average of 17.31 closing days and a maximum of 54 days. Reducing the open-ticket days by half in the hardware segment would significantly decrease the average ticket open days and positively impact customers satisfaction.

Furthermore, the data revealed that many of the tickets were not prioritized based on customer severity. Remarkably, management requested tickets were closed sooner than other employees, regardless of issues and severities. I recommend reviewing the IT help desk's policy to ensure service will be delivered based on the issues and severity but not on other secondary factors, which will boost customer satisfaction. Emphasizing on workforce and skills development of employees would also help toward achieving the goal of reducing open-ticket days and increasing customer satisfaction. The charts below clearly reflect the analysis:

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IT Helpdesk Visual

**Employee Attrition**

"Staff attrition indicates to the loss of employees through a natural process, such as retirement, resignation, elimination of a position, personal health, or other similar reasons" (Dik, 2018, para. 5). Many factors could impact attrition, such as company culture, work environment, work-life balance, or time and promotion potential. However, based on the available data, I analyzed it with the four specific variables: distance from home, education, job role, and monthly income.

My analysis found that attrition increased as the distance increased from home to work. Based on the data, with the average distance of 8.92 from home had "No" attrition, and above the average of 10.63 had "Yes" attrition which indicated that employees prefer to work closer to their homes, and lower attrition occurred.

Likewise, employees with either lower or higher education had a lower attrition rate, and mid level education had the highest level of attrition. Education level 1 had the lowest level of attrition of 2.11%, and education level 3 had the highest attrition rate of 6.73% during 2013-2017.

Similarly, attrition rates were not identical at a different level. Research directors had the lowest attrition rate at 0.14%, and laboratory technicians had the highest attrition rate at 4.22%, followed by sales executives at 3.88%. Attrition and monthly income also revealed an inverse relationship between them. Based on the data, the average monthly income of $6.83k had no attrition, and $4.79k monthly income had attrition on average.

Flexibility on work schedule, providing promotion and career development opportunity, increasing incentives with targeting to the high attrition group will help reduce the attrition rate.

Timeline

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Employee Attrition Visual

**Telco Customer Churn**

Customer churn is the rate at which customers opt-out of purchasing more of a company's products or services; and the rates higher than the industry average can indicate a problem with pricing, service, product quality, delivery, or some other aspect of the customer experience (Caldwell, 2021).

My analysis found that ABC has an overall 26.54% of customer churn in general, but it was different with a particular category. The highest churn rate of 24% was in phone service based on the service area. The churn rate with multi-lines and non-multiline services had the same rate at 12%, and it was only 2% without phone service. The churn rate on internet service with fiber optical was 18%, and DSL was 7%, reflecting that customers prefer DSL due to the lower prices option

Furthermore, the churn rate on online security was significantly low at 4% compared to no-online security at 21%. On online backup, it was 7%, on-device protection 8%, tech support service 4%, TV streaming service 12%, and movie streaming services 13%. TV and movie streaming services did not significantly differ in customer churn with and without the services.

Moreover, based on account types, the customer churn rate with the two-year contract was only 1%, one year was 2%, and month to month was 21%, significantly higher than the yearly contract. Similarly, for automatic bank transfers was 4%, a credit card was 3%, an electronic check was 15%, and the mailed check was 4%. Churn with paperless billing was significantly higher at 20% than the paper bill at 7%. Also, the line chart reflects a churn rate and tenure with an inverse relationship. However, the monthly charge and churn rate had a positive correlation because as the average monthly payment increased, the churn rate also increased, which was an expected relationship.

While analyzing demography, I found that male and female customers did not differ in churn rate because both had a 13% rate. However, seniority significantly impacted the churn rate because seniors had only 7%, but non-seniors had 20%. The churn rate with partners was 9%, and customers with no partner had a 17%. Also, dependent customers had only a 5% churn rate, while non-dependent customers had a significantly higher rate at 22%.

The higher churn rate on fiber optical reflected higher pricing than DSL; therefore, the price revision is recommended for the fiber service. The lower churn rate with the customers who had multiple services such as online backup, online security, TV, and movie streaming services compared to not having those services indicated that offering more services to a customer will reduce customer churn. Also, since electronic payment, paperless billing, and the yearly contract had lower customer churn rates than not having those services; therefore, I advise ABC to focus on those areas of services to retain more customers.**Graphical user interface, application, bar chart, PowerPoint

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**Graphical user interface, chart, application

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**Chart, bar chart, waterfall chart

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Telco Customer Churn Visual

**Accounts Receivable**

Efficient and prioritized collections based on risk but not the outstanding amount can help a company collect on receivables more successfully and save collection time (Dun & Bradstreet, n.d.). ABC's receivable management efficiency was analyzed based on the parameters such as days to settle, late payment, paperless billing, and the disputed status.

Among the 100 customers, 21 customers had an average late payment of more than seven days. Customer 2621-XCLEH had the worst average settlement and late payment days with 50 and 20, respectively, followed by customer 8102-ABPKQ with 45 days to settle and 15 days of late payment. In contrast, 17 customers did not have late payments yet, and settlement days ranged from 4 to 19 days. Customer 3271-HYHON had the least average settlement days of four, followed by customer 6296-UKEUZ with five days.

Furthermore, electronic billing was the best method for faster average settlement and late payment days reduction than paper bills. The average to settle was 29 days for paper bills, while it was 24 average days for electronic invoicing. Similarly, the average late payment for a paper bill was four days, while it was only two days for an electronic invoice, which was a 50% reduction on late payment.

While analyzing collection efficiency by year, I found that the average settlement days were improved in 2013 compared to 2012. Unfortunately, the collection efficiency after 2013 was found significantly decreased, which should be concerning to the management. Encouraging customers for a paperless bill, improving the billing system for dispute reduction, and prioritizing collections based on risk are recommended to collect receivables quicker and in an efficient manner.

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Accounts Receivable Visual

**Operations Dem Planning Bike Share**

Operation of Dem bike share planning remains one of ABC's business portfolios. As required, humidity, seasons, holidays, weekdays, workdays, and outside temperatures were considered as the variables.

While analyzing the ride's demand based on humidity, I found that it was strongly affected by the level of humidity, and bike ride demand declined both in very low and very high humidity. The ideal humidity was at 0.20, where the highest average number of 398 riders' demands occurred.

Similarly, summer had the highest bike ride demand, followed by spring, and winter had lower bike demand. Interestingly, the demand was significantly higher on non-holidays compared to holidays. Also, the average demand was higher on working days which indicated that people were using bike-share services to commute to work resulting from the rising city's high traffics.

Moreover, August had the highest rides demand of 351.19k, followed by June of 346.34k. January and February were months of lowest demands of 134.93k and 151.35k, respectively. However, the rides hours for all months were not significantly different and ranged from 15.64k to 17.11k throughout the year.

The temperature was one of the factors that affected the ride's demand. The demand was highest when the temperature was 77 degrees. In contrast, rides demand was significantly lower when the temperature was lower than the 30s and above 90s.

Hence, ABC should expect the rides demand to be lower in holidays, non-workdays, very cold and hot seasons, and higher between May and October, during workdays, and ideal outdoor temperatures around the 70s. A plan of fulfilling the ride's demands based on the circumstances identified above will be helpful to bike share operation planning.

Graphical user interface, application

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**Chart

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Bike Share Visual

**Retail Sales and Marketing, Profit and Cost**

Analysis of sales, cost, revenue is essential that visualizes the business performance. For ABC, it is helpful to determine the possibility of market expansion product development and identify product demand and profitability.

My analysis found that the average global yearly revenue had steadily increased. 2016 accounted for the highest global revenue of $971 million, and product "Zone" influenced that revenue with 1.63 million of quantity sales. As indicated in the chart below, Europe had the largest market share concentration for ABC's products; however, the United States seemed to be the biggest market compared to individual countries. Asia, South America, and Australia had the third, fourth, and fifth market share.

On revenue by product lines analysis, personal accessories products were the highest revenue contributor and primarily sold in Europe. The camping, golfing, mountaineering, and outdoor protection product lines were second, third, fourth, and fifth revenue contributors. Europe alone had 18.25% revenue contribution in the personal accessory, 14.59% in camping equipment, 6.72% in golf equipment, 3.81% in mountaineering, and 0.70% in outdoor protection lines. North America was the second-largest revenue contributor in these product lines with 11.43%, 9.29%, 6.72%, 2.38%, and 0.44%, respectively.

When analyzing the profit by year, I found that Europe contributed the largest share of gross profit in all years, followed by North America. 2016 accounted for the highest gross profit of $183 million in Europe. In 2017, North America accounted for the region's highest gross profit of $118 million. In contrast, South America and Australia were the minor profit contributor for those years, which was resulted from a small market share in those regions.

Also, planned and actual revenue had a consistent gap of $42 million on average throughout the years, and ABC has not achieved its revenue goal yet. However, its average revenue growth seemed to be upward, except for a slight decrease in 2017.

The web sales method was the dominant method, which accounted for 79.25% of revenue as a whole, followed by the telephone method 7.26%, and the sales visit method 6.6%. The email, fax, mail, and special methods were the least preferred methods, indicating that most customers prefer buying over the websites.

Among the top 10 selling product types, eyewear was leading with 27.66% of sales, and it was followed by cooking gears 18.25%, knives 9.85%, climbing access 7.97%, insect repellents 7.90%, sunscreen 7.33%, lanterns 6.57% watches 5.86%, tents 4.31%, and sleeping bags 4.29%. These sales percentages indicated that customer demand was much higher on these product types than the others.

An analysis of profit by product types found that eyewear led others with 18.54% of gross profit among the entire product types, followed by watches with 12.24%. And the minor contributors were first-aid categories with 0.33% of gross profit contributions.

Map

Description automatically generatedMoreover, my recommendations to ABC are to improve its website, including artificial intelligence (AI) features and subscription of customer relationship management (CRM) software. CRM, Salesforce as an example, enhances the customer relationship by keeping in touch with them, including automatic follow-up after a purchase, automatic billing, a reminder of payment, and finding new customers, which will increase customer retention and business profitability (Salesforce, n.d.). A good customer relationship and focus on the high-demand products will ensure ABC's higher profitability.

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Retail Sales and Marketing Visual

**Marketing Campaign**

In the fast-food segment, the test of the promotional campaign of new fast-food showed the mixed result in different locations and markets of ABC's fast-food segment. My analysis found that medium market size responded the best for all promotions. Promotion '3' outperformed with the highest sales of 18% in the medium-size market. In contrast, promotion' 1' worked best in a large market with 14.38%, and the small market size responded to the promotion the same as medium size.

Similarly, among the top 20 locations, promotion '1' worked best in location 209 with the highest average sales amount of $95.09k, followed by location 218 with a sales amount of $91.13k. And promotion 3 performed the best with location 208, with average sales of $88.98, and promotion 2 performed the best in location 204 with an average sales amount of $83.16k.

Furthermore, market ID 3 had the highest sales amount ever compared to others, and market IDs 1 and 2 were the least performing market IDs. Unexpectedly, newer stores were generating higher sales during the promotion than the old ones, and stores below age nine had higher sales than remaining during the camping. Hence, I recommend that ABC focus on these responding locations and newer stores for new menu promotion.

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Marketing Campaign Visual

**Security Policies**

The information security policy should be the number one priority of ABC because threats on security systems have increased as new technologies emerge regardless of in-house or cloud computing. Though cloud vendors take care of the cloud data security, cloud users are also equally responsible for protecting it at the users and policy level. ABC should focus on protecting consumers' data to avoid hefty penalties if a data breach occurs because data are governed by various state-level privacy laws in the United States, such as California Consumer Privacy Act (CCPA) and Colorado Privacy Act (CPA) as an example. Besides, international privacy laws such as General Data Protection Regulation (GDPR), related to the European Union and their nationals, apply no matter where the business is located. However, data security implementation is not beyond possibility with an appropriate security policy.

ABC can enforce data security policies by making control and disaster recovery manual at the corporate level. The security control should be in the areas of physical, access, and communication (Rainer, Prince, & Watson, 2016) as below:

* Access control: It restricts access to unauthorized individuals or users using the resources. Based on the role and company policy, employees should have a limitation of access control. Vigorous password enforcement, two-factor authentication, login timeouts when computers are not used are examples of access control.
* Network Control: A solid firewall to filter out unwanted network traffic, anti-malware or antivirus installation at the corporate level, and an advanced encryption data system is necessary to protect from unwanted harm to the network.
* Information system Auditing: Periodic security system is necessary to determine how the security measures are functioning. It will also find out whether a security breach was occurred and improve the action in the future.

ABC's current practices for relying on individual employees to protect PCs from antivirus, allowing employees to install anything in PCs, use of external flash drives have made its system vulnerable and has increased data insecurity. Portable media such as DVDs or USBs may easily infect computers from malware and viruses. A study revealed that 25% of malware or malicious programs are spread today through USB devices (Walters, 2012).

Furthermore, all removable media devices should be restricted except where there is a good business case and that has been authorized by the organization's chief of IT (Pg. 4-5).I also recommend ABC subscribe to a secure email gateway because it scans and processes all incoming and outgoing emails and ensures no threats exist (Proofpoint, n.d.). A subscription to either Proofpoint or CISCO secured email gateway is recommended because they are the top-rated servicer provider in the industry.

**Summary**

IT help desk was the first analyzed data of this project. The finding was that the service priorities were not assigned appropriately, and instead, it was based on employees' judgment and seniority. I found that services based on the issues and severity would boost customer satisfaction. On employee attrition, flexibility on work schedule, promotion, career development opportunity, and increasing incentives were associated with lower attrition rate. Regarding customer churn, electronic payment, paperless billing, yearly contract, and multiple service packages such as online backup, online security, TV, and movie streaming service effectively reduced customer churn. On account receivable, an electronic or paperless billing was effective on 50% late payment reduction. The collection efficiency weaning after 2013 was concerning, and prioritizing collections based on risk is recommended to collect receivables quickly and efficiently.

Furthermore, on Dem bike ride share planning, demand was found to be dropped in holidays, non-workdays, very cold and hot seasons. In contrast, it was higher between May and October, during workdays, and ideal outdoor temperatures around the 70s. Similarly, eyewear product type led others on marketing camping, and watches followed it. In the fast-food segment, newer stores generated higher revenue than the old ones during the promotion. Finally, creating and implementing a security policy, control, and disaster recovery manual was recommended for data security and minimizing damage.

Feel free to reach out to me with any questions!

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